BAKER & MCKENZIE

RECEIVED
CENTRAL FAX CENTER

OCT 2 8 2004

Facsimile Transmission

Baker & McKenzie LLP 805 Third Avenue New York, NY 10022, USA

Tel: +1 212 751 5700 Fax: +1 212 759 9133 www.bakemet.com

Date

October 28, 2004

Phone

Fax

To

Examiner Alan D. Diamond, Group Art

703-872-9306

Unit 1753, USPTO

+1 212 891 3577

+1 212 310 1677

Client/Matter No. 22122878-10

Eunhee Park

Re

From

Application no. 10/052,004

Pages (w/cover)

59

Please see attached.

Privacy And Confidentiality Notice

The information contained in this facsimile is intended for the named recipients only. It may contain privileged and confidential information and if you are not an intended recipient, you must not copy, distribute or take any action in reliance on it. If you have received this facsimile in error, please notify us immediately by a collect telephone call to Office Services at +1 212 751 5700 x 4048 and return the original to the sender by mall. We will reimburse you for the postage.

Baker & McKenzle LLP is a member of Baker & McKenzle International, a Swiss Verein.

RECEIVED CENTRAL FAX CENTER

OCT 2 8 2004

PTO/SB/21 (09-04)
Approved for use through 07/31/2008, OMB 0651-0031

Under the Paperwork Reduction Act of 1995, no r	U.S. P.	atericano fra action of infor	mation unless it d	isplays a valid OMB control number.	
Under Lar Statistics	Application Number	10/052,004			
TRANSMITTAL	Filing Date	1/7/2002			
FORM	First Named Inventor	Anthony C. 2	Anthony C. Zuppero		
	Art Unit	1753			
	Examiner Name	Alan D. Diar	nond		
(to be used for all correspondence after initial filing	Attorney Docket Number	22122878-1	0		
Total Number of Pages in This Submission					
	ENCLOSURES (Check all	that apply)			
Fen Transmittal Form Fee Attached Arr endment/Reply After Final Affidavits/declaration(s) Excension of Time Request Excress Abandonment Request Information Disclosure Statement Certified Copy of Priority Dc cument(s) Reply to Missing Parts/ Incomplete Application Reply to Missing Parts under 37 CFR 1.52 or 1.53	Drawing(s) Licensing-related Papers Petition Petition to Convert to a Provisional Application Power of Attorney, Revocatio Change of Correspondence A Terminal Disclaimer Request for Refund CD, Number of CD(s) Landscape Table on CD Remarks his correspondence is being facsiming	Address	Appeal of Appeal (Appeal (Appe	Enclosure(s) (please Identify: : and B forms.	
SIGNATU	RE OF APPLICANT, ATTO	RNEY, O	R AGENT		
Firm Name Baker & McKenzie LLP					
Signature Park					
Printed name Eunhee Park, Esq.					
Date October 28, 2004		Reg. No.	42,976		
CER I hereby certify that this correspondence is bein sufficient postage as first class mall in an envelopment between the date shown below:	RTIFICATE OF TRANSMISS g fecsimile transmitted to the USPT ope addressed to: Commissioner fo	O or denos	ited with the Un	ited States Postal Service with Alexandria, VA 22313-1450 on	
Signature	2 July				
Typed or printed name Amelia Finker			Date	10/28/2004	

This collection of Information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, xeparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief information Officer, U.S. Patent and Tredemark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

20003

OCT 2 8 2004

22122878-10

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

In re Application of: Anthony Zuppero et al.

Art Unit:

1753

Serial No.:

10/052,004

Examiner:

Alan D. Diamond

Filed:

January 17, 2002

Date:

October 28, 2004

Customer No:

26453

Confirmation No.: 9133

For:

ELECTRON-JUMP CHEMICAL ENERGY CONVERTER

Mail Stop Amendment Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

SIR:

- In accordance with the duty of disclosure under 37 C.F.R. § 1.56 and in conformance 1. with the procedures of 37 C.F.R. § § 1.97 and 1.98 and M.P.E.P. § 609, attorneys for Applicants hereby bring the following references, which are listed on the attached modified PTO Form No. 1449 to the attention of the Examiner. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.
- Applicants respectfully request that the following co-owned patents and co-pending 2. applications be considered and made of record in the present application: US Patent Nos. 6,114,620 (cited on PTO-892 by the Examiner); 6,218,608 (cited on PTO-892 by the Examiner); 6,222,116 (cited on PTO-892 by the Examiner);

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, Group Art Unit 1753 at (703) 872-9306 on October 28, 2004.

NYCDM3/431160.1

22122878-10

6,268,560 (cited on PTO-892 by the Examiner); 6,327,859 (cited on PTO-892 by the Examiner); 6,700,056 (cited on PTO-892 by the Examiner); 6,678,305 (cited on PTO-892 by the Examiner); 6,649,823 (cited on PTO-892 by the Examiner); 6,327,859 (cited in the Office Action of September 23, 2004); 6,268,560; and US Patent Application Nos. 09/682,363 (cited on PTO-892 by the Examiner); 10/218,706 (cited on PTO-892 by the Examiner); 10/185,086 (cited on PTO-892 by the Examiner); 09/631,463 (cited in the Office Action of September 23, 2004); 10/625,801 (cited in the Office Action of September 23, 2004); 10/625,801 (cited in each of those patents and applications are listed on Form 1449 accompanying this information disclosure statement.

- Copies of the references listed on the modified PTO form 1449 will follow under separate cover by first class mail due to their volume.
- 4. No fee is deemed necessary with the filing of these documents. If a fee is deemed necessary, we authorize the Commissioner of Patents and Trademarks to charge Deposit Account No.: 02-0393.

Respectfully submitted,

Eunhee Park

Registration No. 42,976

BAKER & McKENZIE

805 Third Avenue

New York, NY 10022

(212) 751-5700 telephone

(212) 759-9133 facsimile

Sheet

PTO/SB/08A (08-03) Approved for use through 07/31/2008, OMB 0651-0031

Under the Paper	work Reduction Act of 1995, no persons are required		tion unless it contains a valid OMB cont	
			mplete if Known	
0003100000	J. 1740.110	Application Number	10/052,004	-
INFORMATION DISCLOSURE		Filing Date	1/17/2002	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)	First Named Inventor	Anthony C. Zuppero		
	Art Unit	1753		
(Use as many sheets as necessary)		Examiner Name	Alan D. Diamond	
Sheet	of	Attorney Docket Number	22122878-10	

C				DOCUMENTS	
Examiner Cite Initials* No.		Document Number Number-Kind Code ^{2 (* Image)}	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	L			F	
	L	^{US-} 4753579	06-1988	Murphy	
		^{US-} 5525041	06-1996	Deak	
	Γ -	^{US-} 5299422	04-1994	Nakagawa et al.	
	$\lceil \cdot \rceil$	^{US-} 5317876	05-1994	Nakagawa et al.	
	Γ -				
•			·		
	-		l .	•	
	<u> </u>				
	_		·	T	
	-				
	- -		· '	;- -	
	 -			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
				<u> </u>	
	-	<u> </u>			· · · · · · · · · · · · · · · · · · ·
			-i -	T	
		·	 	·	
-	<u> </u>	-	1	1-	
	 -	·	•	•	
	L		2022	•	

		FORE	GN PATENT DOCU	MENTS	•	
Examiner Cite Initials No.	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages	Π	
		Country Code "Number * "Kind Code" (# known)	MM-DD-YYYY	7 Character of Cities Docomonic	Or Relevant Figures Appear	76
			,			-
		•			i.	F
					,	

	•			
Evenines				
Examiner		Date		
Signature			3	
O'BITOLUIG		Considered	1	
THE OF LANDING		1		

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. *Applicant's unique citation designation number (optional). *See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. *Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). *For Japanese patent documents, the Indication of the year of the reign of the Emperor must precede the serial number of the patent document. *Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. *Applicant is to place a check mark here if English language.

Transation is attached.

This collection of information is required by 37 CFR 1.97 and 1.88. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND

To: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Approved for use through 07/31/2008.	OMB	0651	-003
Patent and Trademark Office: U.S. DEPARTMENT	OF C	384845	=DC

US Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Complete If Known Substitute for form 1449/PTO **Application Number** 10/052,004 Filing Date INFORMATION DISCLOSURE 1/17/2002 First Named Inventor Anthony C. Zuppero STATEMENT BY APPLICANT Art Unit 1753 (Use as many sheets as necessary) **Examiner Name** Alan D. Diamond Sheet Attorney Docket Number 22122878-10

U. S. PATENT DOCUMENTS Exambe Document Number **Publication Date** Name of Patentee or . Applicant of Cited Document Initials* No. Pages, Columns, Lines, Where MM-DD-YYYY Relevant Passages or Relevant Figures Appear Number-Kind Code² (Floround ^{US-} 20020070632 06-2002 Zuppero et al. ^{US-} 4651324 03-1987 Prein et al. US-5337329 08-1994 Foster, Jack US- 4756000 07-1988 Macken, John A. US- 5999547 12-1999 Schneider et al. us-5048042 09-1991 Moser et al. ^{US-} 5587827 12-1996 Hakimi et al. us. 4012301 03-1977 Rich et al. US- 5470395 11-1995 Yater et al. US-UŞ. us-US-

Examiner	Cite	Foreign Patent Document FORE	GN PATENT DOCU	MENTS		
Initials*	No.1	Country Code ³ Number ⁴ "Qnd Code ⁵ (# knawn)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	_
						┝
						Ĺ
					 	L
						\vdash
						ľ

Examiner			<u> </u>	_
Signature		Date		_
'EXAMINER:	Initial if reference considered, whether or not citation is in a confirmation in the c	Considered		

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered, include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For the appropriate symb is as indicated on the document under WIPO Standard ST.18 if possible. ⁸ Applicant is to place a check mark here if English language

Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This coffection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments and trademark Office P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND

TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Sheet

	PTO/SB/08A (08-03)
	Approved for use through 07/31/2008. ONLY need noted
Under the Panerwork Reduction Act of 1995, no namena and annual at	U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE or respond to a collection of information unless it contains a wild ONE.
The state of the s	o respond to a collection of information unless it contains a would be a

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Co	mplete if Known
Application Number	10/052,004
Filing Date	1/17/2002
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-10

		U C Datas	Dec.	U.S. PATENT DOCI	MENTS	
Dæminer Initials*	Cite No.1	U.S. Patent Number	(If known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-OD-YYYY	Pages, Columns, Lines, Where Reisvant Passages or Returent
4		5,651,8		Praas et al.	07-29-1997	Figures Appeller
		5,932,8	85	DeBellis et al.	08-03-1999	
					 	
	I					
T	T				 	
				· · · · · · · · · · · · · · · · · · ·		
$\Box \Box \Box$						
				`		
T					 	
					 	·
						
 -					-	
	-	~~~~	 -			
		·····				
<u>-</u> -						
<u>-</u> -		<u>.</u>				
	<u> </u>		L.			

				•	FORE	IGN PATENT DOCUMEN	S		
Examine: Cite Initials' No.1	Cita		oreign Patent Do	cument			Date of Publication of	Peges, Columna, Lines,	_
		Office ³	Number ⁴		Code [‡] (10 MTI)	Name of Palentes or Applicant of Cited Document	Cited Document MM-DD-YYYY	Where Rek vent Passages or Relevant Figures Appear	1
									+-
									+-
									+-
									╂
								·	╀
									↓_
									4_
									. _
			· · · · · · · · · · · · · · · · · · ·						
			····				<u> </u>		

Examiner		
	Date	
Signature		
	Considered	
*EVANBLED AND PARTY		

Burden Ho ir Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not include copy of this form with next communication to applicant.

¹ Unique c tailon designation number. *See attached Kinds of U.S. Patent Occurrents. ³ Enter Office that issued the document, by the two-letter code (WiPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WiPO Standard ST. 18 if possible. ⁴ Applicant is to place a check mark here if English language Translation is attached.

	11 C Patent and T. 1 Con and Gir V//3 1/2000. OMB 0851-003
I bedonthe Borne A. B. A. H. A. A. A. A. A.	U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE to respond to a collection of information unless it contrales a void OMB.
Under the Paperwork Reduction Act of 1995, no porcess are an all the	The state of t
the required to the results are required to	to a collection of information union.
	the second of injuriation unless it contains a wolld OMD contains as the

Substitute for form 1449/PTO

Sheet

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

1	Co	mplete if Known
	Application Number	10/052,004
L	Filing Date	1/17/2002
L	First Named Inventor	Anthony C. Zuppero
Į	Art Unit	1753
	Examiner Name.	Alan D. Diamond
I	Attorney Docket Number	22122878-10

	_	Daine Marie	U.S. PATE	NT DOCUMENTS	
Examine Initials	Cite No. 1	Document Namber Number-Kind Code* (if known	Publication Date MM-DD-YYYY	Name of Patentes or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant
	↓ .	us- 4,634,641 .	01-06-1987	Nozik	Figures Appear
	Ĺ.	US- 5,488,231	01-30-1996	Kwon et al.	
	L _	us- 5,757,833	05-26-1998	Arakawa et al.	
	L _	US- 5,917,195	06-29-1999	Brown	
Ę		บร- 6,067,309	05-23-2000	· Onomura et al.	
	-		~ · · · · · · · · · · · · · · · · ·		
	•				
	L.	US-		- ·	
	×	US-	· · · · · · · · · · · · · · · · · · ·		
		US-			
		US-			
		US-			
		U9-			
	[US-			
		U8-			
	[US-	··		

		FORE	IGN PATENT D	OCUMENTS		_
Examiner Initials		Foreign Patent Document. Country Code 3 - Number 4 - Kind Code 9 (Filmous)	Buddlesties D.	Name of Patentee or Applicant of Cited Document	Pages, Columns, Unee, Where Refevant Passages or Relevant Figures Appear	7
			·			
					· · · · · · · · · · · · · · · · · · ·	┝
	-					-
	二					
				·		
					~·	

Examiner	· · · · · · · · · · · · · · · · · · ·	_
Signature	Date	
*EVALUE 3	Considered	- 1

*EXAMINE 3: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in 1 Applicant a unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.usepto.gov or MPEP indication of the year of the reign of the Emperor must precede the serial number of the patent document. 8 Kind of document, the appropriate symbols as indicated on the document under WIPO Standard ST. 3). 4 For Japanese patent documents, the appropriate symbols as indicated on the document under WIPO Standard ST. 18 if possible. 8 Applicant is to place a check mark here if Burden Hour Statement. The Applicant is to place a check mark here if

Enginen language translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

		PT	O/SB/08A (08-03)
	_ Approved for use	through 07/31/2008	. OMB 0651-0034
Πđ	Trademark Office: I	J.S. DEPARTMENT	OF COMMERCE

Under the Paperw	ork Reduction Act of 1995, no persons are required on 1449/PTO	to respond to a collection of informa	proved for use through 07/31/2008, OMB 0651-003 mark Office; U.S. DEPARTMENT OF COMMERCE ation unless it contains a valid OMB control number implete if Known
		Application Number	10/052,004
INFORM	MATION DISCLOSURE	Filing Date	1/17/2002
	MENT BY APPLICANT	First Named Inventor	Anthony C. Zuppero
(Use as many sheets as necessary)		Art Unit	1753
	on the state of the constant y	Examiner Name	Alan D. Diamond
Sheet	of	Attorney Docket Number	22122878-10

		U.8, PAT	ENT DOCUMENTS	
Exam ner Initial:	Document Number Number - Kind Code ² (if known	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant
	 US-6084173	07/04/2000	DiMatteo	Figures Appear
<u> </u>	 us.			
	 US-			
	 US-			
	 US-			
	 ບຣ.			
	US.			
	 us.			
	 US-			
	 us-		**************************************	
]	US-			<u> </u>
	 US-	*******************		
	US-			
	 US-			
	US-			
	 US-			
	U8-			
	US-			
	US-			
	 บธ-			

	The state of the s				
	 FORE	IGN PATENT D	OCUMENTS		
Examir er Initials	Foreign Patent Document	DAMANA DA	Name of Patentee or Applicant of Cited Document	Peges, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	76
	 	_,,,,,			
				<u> </u>	_

			~		

		the later than the same of the later than the later
Examiner		
	Date	
Signature		i e
	Considered	

EXAM:NER: Initial if reference considered, whether or not cliation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique cliation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.usplo.gov or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the appropriate symbols as indication on the document under WIPO Standard ST. 16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

Burden (dour Statement: This form is estimated to take 2.0 hours to complete. Time will use depending times the needed the individual case.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief information Officer, U.S. Patent and Trademurk Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Substitute for form 1449/PTO

PTO/SB/08A (08-03)
Approved for use through 07/31/2006, OMB 0651-0031
U.S. Patent and Trademerk Office; U.S. DEPARTMENT OF COMMERCE
Under title Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number,

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

	Co	mplete if Known	
	Application Number	10/052,004	
	Filing Date	1/17/2002	
	First Named Inventor	Anthony C. Zuppero	
	Art Unit	1753	
	Examiner Name	Alan D. Diamond	
_	Attorney Docket Number	22122878-10	

Examiner Initials	Cite	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), nublisher, city and/or country where nublished	
		HARRISON, P. et al., The Carrier Dynamics of Far-Infrared Intersubband Lasers and Tunable Emitters, Institute of Microwaves and Photonics, University of Leeds, U.K., pp. 1-64	Ī
		WEBER, et al., to X2 Electron Transfer Times in Type-II GaAs/A1As Superflattices Due to Emission of Confined and Interface Phonons, Superlattices and Microstructures, Vol. 23, No. 2 (1998).	
		FANN, W.S. et al., Electron Thermalization in Gold, Physical Review B, Brief Reports, Vol. 46, No. 20, (1992)	Ī
		Ultrafast Surface Dynamics Group, Time-Resolved Two-Photon Photoemission (TR-2PPE), http://www.ilp.physik.unl-essen.de/aeschlimann/2y_photo.htm	T
		LEWIS et al., Vibrational Dynamics of Molecular Overlayers on Metal Surfaces, Dept. of Chemistry, University of Pennysivania, http://lorax.chem.upenn.edu/molsum/cucotalk/html.	1
		RETTNER et al., Dynamics of the Chemisorption of 02 on Pt(111): Dissociation via Direct Population of a Molecularly Chemisorbed Precursor at High Incidence Kinetic Energy, The Journal of Chemical Physics, Vol. 94, Issue 2 (1991)	
l ha mile i man sinasir bibabb		FRIEDMAN et al., SiGe/Si THz Laser Based on Transitions Between Inverted Mass Light-Hole and Heavy Hole Standards, Applied Physics Letters, Vol. 78, No. 4 (2001)	
		HARRISON et al., Population -Inversion and Gain Estimates for a Semiconductor TASER	
		HARRISON et al., Theoretical Studies of Subband Carrier Lifetimes n an Optically Pumped Three-Level Terahertz Laser, Superlattices and Microstructures, Vol. 23, No. 2 (1998)	
		HARRISON et al., Room Temperature Population Inversion in SiGe TASER Designs, IMP, School of Electronic and Electrical Engineering, The University of Leeds	
1 Ti to the section of the section o		SUN et al., Pheonon-Pumped Terhertz Gain in n-Type GaAs/AlGaAs Superlattices, Applied Physic Letters, Vol. 7, No.22 (2001)	

1Examiner	Date	
Signature	Considered	

^{*}EXAM-NER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw the through citation if not in conformance and not considered, include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTO/SB/08A (08-03) Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

Application Number

Application Number

Application Number

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Application Number 10/052,004
Fiting Date 1/17/2002
First Named Inventor Anthony C. Zuppero
Art Unit 1753
Examiner Name Alan D. Diamond
Attorney Docket Number 22122878-10

Examiner Initials	Cite No.1	include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), printisher, city and/or country where numbered.	-
	: :	ALTUKHOV et al., Towards Si1-xGex Quantum-Well Resonant-State Terahertz Laser, Applied Physics Letters, Vol. 79, No. 24 (2001)	
		SUN et al., Intersubband Lasing Lifetimes of SIGe/SI and GaAs/AIGaAs Multiple Quantum Well Structures, Applied Physics Letters, Vol. 66, No. 25 (1995)	-
		SUN et al., Phonon Pumped SiGe/SI Interminiband Terahertz Laser	-
		SOREF et al., Terhertz Gain in a SIGe/Si Quantum Starcase Utilizing the Heavy-Hole Inverted Effective Mass, Applied Physics Letters, Vol. 79, No. 22 (2001)	
	· .	AESCHLIMANN et al., Competing Nonradative Channels for Hot Electroni Induced Surface Photochemistry, Chemical Physics 202, 127-141 (1996)	
		AUERBACH, Daniel J., Hitting the Surface-Softly, Science, Vo. 294, pp. 2488-2489 (2001)	1
	[]	BADESCU et at., Energetics and Vibrational States for Hydrogen on Pt(111), Physical Review Letters, Vol. 88, No. 13 (2002)	
	Ì	BALANDIN et al., Effect of Phonon Confinement on the Thermoelectric Figure of Merit of Quantum Wells, Journal of Applied Physics, Vol. 84, No. 11 (1998)	t
		BARTELS et al., Coherent Zone-Folded Longitudinal Acoustic Phonons in Semiconductor Superlattices: Excitation and Detection, Physical Review Letters, Vol. 82, No. 5 (1999)	ļ
; ;	1	BAUMBERG et al., Ultrafast Acoustic Phonon Ballistics in Semiconductor Heterostructers, Physical Review Letters, Vol. 78, No. 17 (1997)	
Haman da session a deserta		BEDURFTIG et al., Vibrational and Structural Properties of OH Adsorbed on Pt(111), Journal of Chemical Physics, Vol. 111, No. 24 (1999)	-

Examiner	Make	
	Date	i e
Signature	Considered	į
	i Considerea	

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English (anguage Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any Office, Waithington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents,

Approved for use through 07/31/2006. OMB 0551-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Application Number 10/052,004 Filing Date 1/17/2002 First Named Inventor Anthony C. Zuppero Art Unit 1753 Examiner Name Alan D. Diamond 22122878-10 Attorney Docket Number

Complete if Known

Examiner initials	Cile No. 1	Include name of the author (in CAPITAL LETTERS), tille of the article (when appropriate), tille of the item (book, magazine, journal, serial, symposium, calalog, etc.), date, page(s), volume-issue number(s), publisher, div andior country where published.	1
	 	VALDEN et al., Onset of Catalytic Activity of Gold Clusters on Titania with the Appearance of Nonmetallic Properties, Science, Vol. 281 (1998)	
	r i	BONDZIE et al., Oxygen Adsorption on Well-Defined Gold Particles on TiO2(110), J. Vac. Sci. Technol. A17(4) (1999)	
		BEZANT et al., Intersubband Relaxation Lefetimes in p-GaAs/AlGaAs Quantum Wells Below theLO-Ohonon Energy Measured in a Free Electron Laser (Experiment, Semicond, Sci. Technol, 14 (1999)	T
	t 	BRAKO et al., Interaction of CO Molecules Adsorbed on Metal Surfaces, Vacuum 61,89-93 (2001)	T
	! . 	BURGI et al., Confinement of Surface State Electronis in Fabry-Perot Resonators, Physical Review Letters, Vol. 81, No. 24 (1998)	
	1	BURGI et al., Probing Hot-Electron Dynamics at Surfaces with a Cold Scanning Tunneling Microscope, Physical Review Letters, Vol. 82, No. 22 (1999)	
		CHANG, Y.M., Interaction of Electron and Hold Plasma with Coherent Longitudinal Optical Phonons in GaAs, Applied Physics Letter, Vol. 80, No. 14 (2002)	
	 1 1	CHANG et al., Observation of Coherent Surface Optical Phonon Oscillations by Time-Resolved Surface Second-Harmonic Generation, Physical Review Letters, Vol. 78, No. 24 (1997)	
-	 	CHANG et al., Coherent Phonon Spectroscopy of GaAs Surfaces Using Time-Resolved Second-Harmonic Generation, Chemical Physics 251, 283-308 (2000)	
		CHANG et al. Observation of Local-Interfacial Optical Phonons at Buried Interfaces Using Time-Resolved Second Harmonic Generation, Physical Review B, Vol. 59, No. 19 (1999)	
	†	CHEN et al., Stimulate-Emission-Induced Enhancement of the Decay Rate of Longitudinal Optical Phonons in III-V Semiconductors; Applied Physics Letters, Vol. 80, No. 16 (2002)	-

And in concession of the last		
Examiner	Date	
Signature	Considered	

^{*}EXAMILIER: Inklat if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden: four Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, V/ashington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Approved for use through 07/31/2006. CMB 0851-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known **Application Number** 10/052,004 Filing Date 1/17/2002 First Named Inventor Anthony C. Zuppero Art Unit 1753 Examiner Name Alan D. Diamond Attorney Docket Number 22122878-10

Examiner Initals	Cite No.1	include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), nublisher, div and/or country where nublished.	7
		CORCELLI et al., Vibrational Energy Pooling In CO on NaCI(100): Methods, Journal of Chemical Physics, Vol. 116, No. 18 (2002)	
	 	FIERZ et al., Time-Resolved 2-Photon Photolonization on Metallic Nanoparticles, Appl. Phys. B 68 (1999); http://www.ilp.physik.uni-essen.de/aeschlimann/abstratct.htm#6	
		BEZANT et al., Intersubband Relaxation Lifetimes in p-GaAs/AlGaAs Quantum Wells Below the t.O-Phonon Energy Measured in a Free Electron Laser Experiment, Semicond. Sci. Technol., 14 No. 8 (1999)	l
		BONDZIE et al., Oxygen Adsorption on Well-Defined Gold Particles on TiO2(110), Journal of Vacuum Science & Technology A: Vacuum, Surfaces and Films, Vol. 17, Issue 4, pp. 1717-1720-(1999)	
٠.		HARRISON et al., Maximising the Population Inversion, by Optimizing the Depopulation Rate, in Far-Infared Quantum Cascade Lasers (2001)	
		HARRISON et al., The Carrier Dynamics of Terahertz Intersubband Lasers, Some Publishing Company (1999)	
		FANN et al., Electron Thermalization in Gold, Physical Review B, Vol. 46, No. 20 (1992)	
		CUMMINGS et al., Ultrafast Impulsive Excitation of Coherent Longitudinal Acoustic Phonon Oscillations in Highly Potoexcited InSb, Applied Physics Letters, Vol. 79, No. 6 (2001)	
		CHIANG, T.C., Photoemission Studies of Quantum Well States in Thin Films, Surface Science Reports 39, pp. 181-235 (2000)	
	•	DEBERNARDI et al., Anharmonic Phonon Lifetimes in Semiconductors from Density-Functional Perturbation Theory, Physical Review Letters, Vol. 75, No. 9 (1995)	
		DAVIS et al., Kinetics and Dynamics of the Dissociative Chemisorption of Oxygen on Ir(111), J. Chem. Phys. 109 (3) (1997)	

Examiner		Date	•	
Sinnatura	•	Considered		
C SI ALIGINIA I		L.Considered	 	

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

f Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the Individual case. Any comment on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Petent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Approved for use through 07/31/2008. OMB 0851-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number. Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

	mplete if Known
Application Number	10/052,004
Filing Date	1/17/2002
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-10

E:caminer Initials* /	Cite No. 1	OTHER PRIOR ART — NON PATENT LITERATURE DOCUMENTS Include name of the suther (in CAPITAL LETTERS), title of the article (when appropriate), title of the liem (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), nublisher, city and/or couple where published	,
		CHOI et al., Ultrafast Carrier Dynamics in a Highly Excited GaN Epilayer, Physical Review B., Vo. 63, 115315 (2001)	
		DIEKHONER et al., Parallel Pathways in Methanol Decomposition on PT(111), Surface Science 409, pp. 384-391 (1998)	-
		DEMIDENKO et al., Piezoelectrically Active Acoustic Waves Confined in a Quantum Well and Their Amplification by electron Drift, Semiconductor Physics, Quantum Electronics & Optoelectronis, Vol. 3, No. 4, pp. 427-431-(2000) de PAULA et al., to X2 Electron Transfer Times in Type-II Superlattices Due to Emission of Confined Phonons, Appl. Phys. Lett. 65 (10) (1994)	
		de PAULA et al., Carrier Capture via Confined Phonons in GaAs-AlGaAs Multiple Quantum Wells, Selcond, Sci. Technol, 9, pp. 730-732 (1994) DEMIØENKO et al., Amplification of Localized Acoustic Waves by the Electron Drift in a Quantum Well, Semiconductor Physics, Quantum Electronics & Optoelectronics, Vol. 2, No. 1, pp. 11-24 (1999)	
	:	DEMIDENKO et al., Generation of Coherent Confined Acoustic Phonons by Driffing Electrons in Quantum Wire; Semiconductor Physics, Quantum Electronics & Optoelectronics, Vol. 3, No. 4, pp. 432-437 (2000). DENZLER et al., Surface Femtochemistry: Ultrafast Reaction Dynamics Driven by Hot Electron Mediated Reaction Pathways, World Scientific (2001)	
<u> </u>	.]	FATTI et al., Temperature-Dependent Electron-lattice Thermalization in GaAs, Physical Review B, Vol. 59, No. 7 (1999)	
1	1	ANASTASSAKIS et al., The Physics of Semiconductors, Vol. 2, World Scientific (1990)	
		de PAULA et al., Carrier Capture Processes in Semiconductor Superlattices due to Emission of confined Phonons, J. Appl. Phys. 77 (12) (1995)	

Evandada	 THE RESERVE OF THE PERSON NAMED IN COLUMN 2 IS NOT THE PERSON NAME	
Examiner	10-4-	
Sicnature	Date	
OICHSIUIG I	1 0	
	Considered	

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance end not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique cliation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Substitute for form 1449/PTO

PTO/SB/08A (08-03)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of Information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many cheets as necessary)

Complete If Known **Application Number** 10/052,004 Filing Date 1/17/2002 First Named Inventor Anthony C. Zuppero Art Unit 1753 **Examiner Name** Alan D. Diamond Attorney Docket Number 22122878-10

	_	OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
Examiner Initials	Cite No. ¹	include name of the author (in CAPITAL LETTERS), tile of the erticle (when appropriate), tile of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	1
		ENGSTROM et al., Comparing the Vibrational Properties of Low-Energy Modes of Molecular and an Atomic Adsorbate: CO and O on Pt(111), Journal of Chemical Physics, Vol142, No. 4 (2000)	a
		GLAVIN et al., Generation of High-Frequency Coherent Acoustic Phonons In a Weakly Coupled Superlattice, Applied Physics Letters, Vol. 74, No. 23 (1999)	
	. . =	FRIEDMAN, SiGe/Si Thz Laser Based on Transitions Between Inverted Mass Light-Hole and Heavy-Hole Subbands, Applied Physics Letters, Vol. 78, No. 4 (200 ERMOSHIN et al., Vibrational Energy Relaxation of Adsorbate Vibrations: A	1
		theoretical Study of the H/Si(111) System, J. Chem. Phys. 105 (20) (1996.	l
	. —.	GLAVIN et al., Acoustic Phonon Generation in A Superlattice Under the Hopping Perpendicular Transport, United Nations Educational Scientific and Cultural Organization-And-International-Atomic-Energy-Agency-(1998)	
	,	GERGEN et al., Chemically Induced Electronic Excitations at Metal Surfaces, Sciencé, Vol. 294 (2001).	
	r. 	HAGSTON et al., Simplified Treatment of Scattering Processes in Quantum Well Structures, Journal of Applied Physics, Vol. 90, No. 3 (2001).	
		HARRISON et al., Room Temperature Population Inversion in SiGe TASER design	s
		HARRISON et al. The Carrier Dynamics of Terhertz Intersubband Lasers, Some Publishing Company (1999)	-
		HARRISON et al., Population-Inversion and Gain Estimates for a Semiconducor Taser	
		HARRISON et al., Theoretical studies of Subband Carrier Lifetimes in an Optically Pumped Three-Level Terahertz Laser, Superlattices and Microstructures, Vol. 23, No. 2 (1998)	

Examiner	Date	
Signature	Considered	

^{*}EXAMPLER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Transtation is attached.

Burden four Statement: This form is estimated to take 2.0 hours to complete. Time will very depending upon the needs of the individual case. Any commerts on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Substitute for form 1449/PTO

PTC/SB/08A (08-03)

Approved for use through 07/31/2006, OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE

STATEMENT BY APPLICANT (Use as many sheets as necessary)

Complete if Known Application Number 10/052,004 Filing Date 1/17/2002 First Named Inventor Anthony C. Zuppero Art Unit 1753 **Examiner Name** Alan D. Diamond Attorney Docket Number 22122878-10

Examiner Initials	Cite No.1	include name of the author (in CAPITAL LETTERS), life of the article (when appropriate), life of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(e), volume-issue number(s), publisher, city and/or country where published.
	')	HARRISON et al., The Carrier Dynamics o Far-Infared Intersubband Lasers and Tunable Emitters, www.ee.leeds.ac.uk/homes/ph/
	_	HESS et al., Hot Carrier Relaxation by Extreme Electron-LO Phonon Scattering in GaN
•••••		HOHLFELD et al., Electron and Lattice Dynamics Following Optical Excitation of Metals, Chemical Physics 251, pp. 237-258 (2000)
	•	HUANG et al., Vibrational Promotion of Electron Transfer, Science, Vol. 290 (2000
]	KAWAKAMI et al., Quantum-well States in Copper Thin Films, Nature, Vol. 398 (1999)
:		KOHLER et al., Enhanced Electron-Phonon Coupling at the Mo and W (110) Surfaces Induced by Adsorbed Hydrogen, mtrl-th/9510004 (1995)
	'] [LEWIS et al., Continuum Elastic Theory of Adsorbate Vibrational Relaxation, J. Chem. Phys. 108 (3) (1998)
		LEWIS et al., Controlling Adsorbate Bivrational Lifetimes Using Superlattices, Physical Review B, Vol. 63, 085402 (2001)
		KOMIRENKO, Sergly M., Phonons and Phonon-Related Effects in Prospective Nanoscale Semiconductor Devices (2000)
		HUANG et al., Observation of Vibrational Excitation and Deexcitation for NO(v=2) Scattering from Au(111): Evidence for Electron-Hole-Pair Mediate Energy Transfer Physical Review Letters, Vol. 84, No. 13 (2000)
		LEWIS et al, Substrate-Adsorbate Coupling in Co-Adsorbed Copper, Physical Review Letters, Vol. 77, No. 26 (1996)

Examiner	D-4-	
	Date	
Slonature	lonate d	
	Considered	

^{*}EXAMINEF: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw tine through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents.

Approved for use through 07/31/2008. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449/PTO

Sheet

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete If Known					
Application Number	10/052,004				
Filing Date	1/17/2002				
First Named Inventor	Anthony C. Zuppero				
Art Unit	1753				
Examiner Name	Alan D. Diamond				
Attorney Docket Number	22122878-10				

		OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS
Examiner Initials	Cite No.1	the third of the author (in CAPITAL LETTERS), tile of the article (when appropriate), tile of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), nublisher, city and/or country where publisher.
		KRAUSS et al., Coherent Acoustic Phonons In a Semiconductor Quantum Dot, Physical Review Letters, Vol. 79, No. 25 (1997)
		LUGLI et al., Interaction of Electrons with Interface Phonons in GaAs/AlAs and GaAs/AlGaAs Heterostructures,Semicond. Sci. Technol. 7 (1992)
· 		NIENHAUS et al., Electron-Hole Pair Creation at Ag and Cu Surfaces by Adsorption of Atomic Hydrogen and Deuterium, Physical Review Letters, Vol. 82, No. 2 (1999)
		MULET et al., Nanoscale Radiative Heat Transfer Between a Small Particle and a Plane Surface, Applied Physics Letters, Vol 78, No. 19 (2001)
		NIENHAUS et al., Direct Detection of Electron-Hole Pairs Generated by Chemical Reactions on Metal Surfaces, Surface Science 445, pp. 335-342 (2000)
	·	NIENHAUS, Hermann, Electronic Excitations by Chemical Reactions on Metal Surfaces, Surface Science Reports 45, pp. 1-78 (2002)
		NOLAN et al., Translational Energy selection of Molecular Precursors to Oxygen Adsorption on Pt(111), Physical Review Letters, Vol. 81, No. 15 (1998)
		NIENHAUS et al., Selective H Atom Sensors Using Ultrathin Ag/SI Schottky Diode
	F	NOLAN et al., Molecularly Chemisorbed Intermediates to Oxygen Adsorption on of (111): A Molecular Beam and Electron Energy-Loss Spectroscopy Study, Journal of Chemical Physics, Vol. 111, No. 8 (1999)
	to	OLAN et al., Direct Verification of a High-Translational-Energy Molecular Precurso Oxygen Dissociation on Pd(111), Surface Science 419 (1998)
	C A	DGAWA et al., Optical Intersubband Transitions and Femtosecond Dynamics in g/Fe(100) Quantum Wells, Physical Review Letters, Vol. 88, No. 11 (2002)

Exantiner			
	l c	7-4-	
Slan:iture i	4 L	Date	
		Considered	
YAMINED. MINELL	f and a second as	Considered	

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is ettached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents,

Approved for use through 07/31/2006. OMB 0651-0031

U.6. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number. Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Uso as many sheets as necessary)

	Complete if Known		
	Application Number	10/052,004	
	Filing Date	1/17/2002	
	First Named Inventor	Anthony C. Zuppero	
	Art Unit	1753	
	Examiner Name	Alan D. Diamond	
	Attorney Docket Number	22122878-10	

	_	OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
Exeminer Initials	Cite No. 1	include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the litem (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	
	·	PLIHAL et al., Role of Intra-Adsorbate Coulomb Correlations in Energy Transfer al Metal Surfaces, Physical Review B, Vol. 58, No. 4 (1998)	Ų
	_	PAGGEL et al., Quantum-Well States as Fabry-Perot Modes in a Thin-Film Electro	q
·		PAGGEL et al., Quasiparticle Lifetime in Macroscopically Uniform Ag/Fe(100) Quantum Wells, Physical Review Letters, Vol. 81, No. 25 (1998)	1
		PAGGEL et al., Quantum Well Photoemission from Atomically Uniform Ag Films: Determination of Electronic Band Structure and Quasi-Particle Lifetime in Ag(100) Applied-Surface-Science-162-163, pp. 78-85-(2000)	
		PERSSON et al., A First-Principles Potential Energy Surface for Eley-Rideal Reaction Dynamics of H Atoms on Cu(111), Journal of Chemical Physics, Vol. 110 No. 4 (1999)	J.
		OZGUR et al., Control of Coherent Acoustic Phonons in InGaN Multiple Quantum Wells, arXiv:cond-mat/0010170 (2000)	•
		STANTON et al., Energy Relaxation by Hot Electrons in n-GaN Epilayers, Journal Applied Physics, Vol. 89, No. 2 (2001)	l
		STIPE et al., Alomistic Studies of O2 Dissociation on Pt(111) Induced by Photons, Electrons and by Heating, J. Chem. Phys. 107 (16) (1997)	ŀ
-		SUN et al., Phonon Pumped SiGe/Si Interminiband Terahertz Laser, pp. 1-11	ŀ
		SOREF et al., Terahertz Gain in a SiGe/Si Quantum Staircase Utilizing the Heavy-Hole Inverted Effective Mass, Applied Physics Letters, Vol. 79, No. 22 (200	-
.]	1	QU et al., Long-Lived Phonons, Physical Review B, Vol. 48, No. 9 (1993)	-

	•
Examiner	
	Date
Signature	54.6
ordinate I	Considered

^{*}EXAMINEF: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

	Approved to use undagn 07/31/2008. OMB 0651-0031
I Index the Dononwards Doduction Ask of 1005	i, no persons are required to respond to a collection of information unless it contains a valid OMB continumber
SHOEL IN A LABELMOIK LOSCILLION WOLLD! 1885). NO DEFEORS are required to respond to a collection of information unless it contains a unit of the

Complete if Known Substitute for form 1449/PTO **Application Number** 10/052,004 Filing Date 1/17/2002 INFORMATION DISCLOSURE First Named Inventor Anthony C. Zuppero STATEMENT BY APPLICANT Art Unit 1753 (Uso as many sheets as necessary) Examiner Name Alan D. Diamond Attorney Docket Number Sheet 22122878-10

	_	OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS	_
Examiner Initias	Cite No.1	Include name of the author (in CAPITAL LETTERS), ills of the enticle (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	ľ
	i	PONTIUS, et al., Size-Dependent Hot-Electron Dynamics in Small Pdn-Clusters, Journal of Chemical Physics, Vol. 115, No. 22 (2001)	
•		SMIT et al., Enhanced Tunneling Across Nanometer-Scale Metal-Semiconductor Interfaces, Applied Physics Letters, Vol. 80, No. 14 (2002)	
		QIU et al., Long-Distance and Damping of Low-Frequency Phonon Polariton in LiNbO3, Physical Review B, Vol. 56, No. 10 (1997)	
		ROUSSE et al, Non-Thermal Melting in Semiconductors Measured at Femtosecor Resolution, Nature, Vol. 410 (2001)	d
		SCHELLING et al., Phonon Wave-Packet Dynamics at Semiconductor Interfaces t Molecular-Dynamics Simulation, Applied Physics Letters, Vol. 80, No. 14 (2002)	y
		SHIKIN et al., Phase Accumulation Model Analysis of Quantum Well Resonances Formed in Ultra-Thin Ag, Au Films on W(110), Surface Science (2001)	
		SNOW et al., Ultrathin PtSI Layers Paterned by Scanned Probe Lithography, Appl Physics Letters, Vol. 79, No. 8 (2001)	
	t I	PRABHU et al., Femtosecond Energy Relaxation of Nonthermal Electrons Injected p-doped GaAs Base of a Heterojunction Bipolar Transistor, Journal of Applied Physics, Vol. 90, No. 1 (2001)	ľ
refer at Fastamen (g.)	1	TSAI et al., Theoretical Modeling of Nonequilibrium Optical Phonons and Electron Energy Relaxation in GaN, Journal of Applied Physics, Vol. 85, No. 3 (1999)	
		TRIPA et al., Surface-Aligned Photochemistry: Alming Reactive Oxygen Atoms Ale a Single Crystal Surface, Journal of Chemical Physics, Vol. 112, No. 5 (2000)	φ _τ
	'	TRIPA et al., Surface-Aligned Reaction of Photogenerated Oxygen Atoms with Carbon Monoxide Targets, Nature, Vol. 398 (1999)	-

Examiner	Date	
Skonature	 Considered	

^{*}EXAMINIER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicar i's unique citation designation number (optional). 2 Applicant is to pisce a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comment: on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Whethington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTO/SB/08A (08-03)

Approved for use through 07/31/2008, OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number. Complete if Known Substitute for form 1449/PTO **Application Number** 10/052,004 Filing Date 1/17/2002 **INFORMATION DISCLOSURE** First Named Inventor Anthony C. Zuppero STATEMENT BY APPLICANT Art Unit

1753 (Use as many sheets as necessary) **Examiner Name** Alan D. Diamond Attorney Docket Number 22122878-10

Examiner Initials	Cits No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the kem (book, magazine, journal, serial, symposium, catalog, etc.), date, page(a), volume-issue number(s), nuhlisher, city and/or country where nublished
	! 	TRIPA et al., Kinetics Measurements of CO Photo-Oxidation on Pt(111), J. Chem. Phys. 105 (4) (1996)
		TAYLOR et al., Strong Electron-LO Phonon Scattering and Hot Carrier Relaxatin in GaN_Abstract.No. ha249KW3
		SUN et al., Phonon-Pumped Terahertz Gain in n-Type GaAs/AlGaAs Superlattices Applied Physics Letters, Vol. 78, No. 22 (2001)
,		TOM et al., Coherent Phonon and Electron Spectroscopy on Surfaces Using Time-Resolved Second-Harmonic Generation
		TIUSAN et al., Quantum Coherent Transport Versus Diode-Like Effect in Semiconductor-Free Metal/Insulator Structure, Applied Physics Letters, Vol. 79, No. 125 (2001)
,		STROMQUIST et al., The Dynamics of H Absorption in and Adsorption on Cu(111 Surface Science 397, pp. 382-394 (1998)
	Ī	TRIPA et al., Surface-Aligned Photochemistry: Aiming Reactive Oxygen Atoms Alo a Single Crystal Surface, Journal of Chemical Physics, Vol. 112, No. 5 (2000)
		TSAI et al., Theoretical Modeling of Nonequilibrium Optical Phonons and Electron Energy Relaxation in GaN, Journal of Applied Physics, Vol. 85, No. 3 (1999)
		WEBER et al., Carrier Capture Processes in GaAs-AlGaAs Quantum Wells Due to Emission of Confiend Phonons, Appl. Phys. Lett. 63 (22) (1993)
		WINTTERLIN et al., Atomic and Macroscopic Reaction Rates of a Surface-Catalyz Reaction, Science, Vol. 278 (1997)
 .	†	YEO et al., Calorimetric HEats for CO and Oxygen Adsorptin and for the Catalytic CO Oxidation Reaction on Pt{111}, J. Chem. Phys. 106 (1) (1997)

بيهين مصبيص	
Examiner	Date
Sicnature	Considered

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Oraw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Weshington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTC/SB/08A (08-03)
Approved for use through 07/31/2006. OMB 0851-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid QMB control number.

Substitute for form 1449/PTO

Sheet

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known Application Number 10/052,004 Filing Date 1/17/2002 First Named Inventor Anthony C. Zuppero Art Unit 1753 Examiner Name Alan D. Diamond Afterney Docket Number 22122878-10

		OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
Examiner initials	Cks No. 1	include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, citr/and/or country where number(s), publisher, citr/and/or country where number(s).	
:	1,2	Witte et al., Low Frquency Vibrational Modes of Adsorbates, Surface Science, N 1362 (2002)	۶.
		VALDEN et al., Onsel of Catalytic Activity of Gold Clusters on Titania with The Appearance of Nonmetallic Properties, Science, Vol. 281 (1998)	-
		XU et al., Electrical Generation of Terahertz Electromagnetic Pulses by Hot-Electromagnetic Puls	
		WANKE et al., Injectoriess Quantum-Cascade Lasers, Applied Physics Letters, Vo. 78, No. 25 (2001)	
	. 7	ZHDANOV, Vladimir P., Nm-Sized Metal Particles on a Semiconductor Surface, Schottky Model, etc., Surface Science, SUSC 2931 (2002)	-
		YEO et al., Calorimetric Investigation of NO and O adsorptin on Pd{100} and the Influence of Preadsorbed Carbon, J. Chem. Phys. 106 (5) (1997)	
		ZAMBELLI et al., Complex Pathways in Dissociative Adsorption of Oxygen on Platinum, Nature, Vol. 390 (1997)	-
		ZHDANOV et al., Substrate-Mediated Photoinduced Chemical Reactions on Ultrat Metal Films, Surface Science 432 (1999)	nir
	_	ALTUKHOV et al., Towards Si1-xGex Quantum-well Resonant-State Terahertz Laser, Applied Physics Letters, Vol. 79, No. 24 (2001)	
		FRIEDMAN et al., SiGe/Si THz Laser Based on Transitions Between Inverted Mass Light-Hole and Heavy-Hole Subbands, Applied Physics Letters, Vol. 78, No. 4 (200	1)
	}	HARRISON et al., The Carrier Dynamics of Terhertz Intersubband Lasers, Some Publishing Company (1999)	

Examiner	
	Date
Signature	E F
	Considered

^{*}EXAMINEF: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents,

Approved for use through 07/31/2006. OMB 0851-0031 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE Under it a Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Complete If Known Substitute for form 1449/PTO Application Number 10/052,004 Filing Date 1/17/2002 INFORMATION DISCLOSURE First Named Inventor Anthony C. Zuppero STATEMENT BY APPLICANT Art Unit 1753 (Use as many sheets as necessary) **Examiner Name** Alan D. Diamond

				Mail D. Dialilollo	
8t		of	Attorney Docket Number	22122878-10	
		OTHER PRIOR AS	RT - NON PATENT LITERATURE DOCU	MENTO	_
Examiner Initials	Cite No.1	include name of the aut	thor (in CAPITAL LETTERS), 60e of the article (when no, fournal, sorial, symposium, catalog, etc.), date, par	appropriate), title of the	,
	 ```	L nic	mbar(s) publisher rily and/or country where mublisher is Carner Dynamics of Far-Infared Int	ad .	L
		runable Emitters, ww	vw.ee.leeds.ac.uk/homes/ph/	ersubband Lasers and	·
		HARRISON et al., Th	neoretical Studies of Subband Carrier	Lifetimes in an Ontically	┢
		Pumped Three-Level 2-(1998)	Terhertz Laser, Superlattices and Mi	crostructures, Vol. 23, N	þ.
		HÀRRISON et al., Ro	oom Temperature Populatin Inversion	In SiGe TASER Design	,
		HARRISON et al., Po TASER,	opulation-Invension and Gain Estimate	es for a Semiconductor	
		SUN et al., Phonon P	Pumped SiGe/SI Interminiband Terahe	ertz Laser	
		SOREF et al., Terahe Heavy-Hole Inverted	ertz Gain in a SIGe/SI Quantum Stairc Effective Mass, Applied Physics Lette	case Utlizing the ers, vol. 79, No. 22 (200)
		SUN et al., Intersubb Quantum Well Struct	and Lasing Lifetimes of SIGe/Si and C ures, Appl. Phys. Letter 66 (25) (1995	Ga As/AlGaAs Multiple 5)	
٠.	. ;	SUN et al., Phonon-P Applied Physics Lette	Pumped Terhertz Galn in n-Type GaA ers, Vol. 78, No. 22 (2001)	s/AlGaAs Superlattices,	-
		ALBANO et al., Adso Institute for Scientific	rption-Kinetics of Hot Dimers, SciSea Information (1999)	rch Databaseof the	
	,	Molecules on surface	ie-Resolved Measurements of Vibrations: Hydroxyl Groups on Silica Surface by A: Vacuum, Surfaces, and Films, V	s. Journal of Vacuum	
		Relaxation Rates of N	ibrational Relaxation of Adsorbed Moi Model Compunds, Journal of Vacuum nd Films, Vol. 5, Issue 4 (1987)	lecules: Comparison wit Science & Technology .	- A:

-			•
1	Examiner	Date	
-	Signature	Considered	

^{*}EXAMINEF: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Exaniner

Slannture

Approved for use through 07/31/2006. OMB 0651-0031

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a coffection of information unless it contains a varied OMB control number. Complete if Known Application Number 10/052,004 INFORMATION DISCLOSURE Filing Date 1/17/2002 First Named Inventor STATEMENT BY APPLICANT Anthony C. Zuppero Art Unit 1753 (Use as many sheets as necessary) Examiner Name Alan D. Diamond Sheet

2088		of	Attorney Docket Number	22122878-10	_
		OTHER PRIOR ART - NO	ON PATENT ! ITERATURE DOCUM		=
Examiner Inil als	Cita No.1	Rem (book, magazine, journa	APITAL LETTERS), tille of the article (when a I, serial, symposium, calalog, etc.), date, page	ppropriate), title of the	T
·		Pressures as Probed by Su Journal of Catalysis, Vol. 17	lion of Palladium Compared to R rface-Enhanced Raman and Ma	hodium at Ambient ss Spectroscopies.	t
	}[Rates, Physical Review 8, \	of Electronic Relaxation on Cova /ol. 30, Issue 6 (1984)		1
	h	(1998)	nce, Direct Verification of a High- gen Dissoclation on Pd(111), Sur	face Science, Vol. 41	ģ
		PHIHAL et al., Role of Intra- Metal Surfaces, Physical Re FULLY et al., Flectronic and	Adsorbate Coulomb Correlations view B, Vol. 58, Issue 4 (1998)	s in Energy Transfer a	
	1			J.	-
	۵.	01_79. Issue 12 (2001)	Photogeneration of Carriers in a ermal Nonascale Vacuum Gap, A	Applied Physics Letters	- s,
			d Photochemistry: Alming Reacti Journal of Chemical Physics, V	'οι. 112, Issue 5 (200φ)	n(
	-	DEKORSY et al, Coher Superlattics, phys.	rent Acoustic Phons in stat. sp;. (b) 215, p	Semiconductor 425-430 (1999)	
				ı	_
	1	•			

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance Considered and not considered. Include copy of this form with next communication to applicant.

Date

¹ Applicant's linique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached. Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Shealen

PTO/SB/08A (08-03)

Approved for use through 07/31/2008. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE Under the Paperwork Reduction Act of 1995, no persons are required to respond to Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

	Co	mplete if Known
	Application Number	10/052,004
	Filing Date	1/17/2002
	First Named Inventor	Anthony C. Zuppero
	Art Unit	1753
4	Examiner Name	Alan D. Diamond
_	Attorney Docket Number	22122878-10

			U.S. PATE	NT DOCUMENTS	
Examiner Initials	Cite No.1	Document Number Number-Kind Code® (il known	Publication Date	Name of Patentes or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant
		us. 6,119,651	U9-19-2000	Anderson	Floures Appear
	_	us- 5,408,967	04-25-1995	Foster	
·		us- 5,293,857	03-15-1994	Mëyer	
	,	US-2002/0121088	9-5-2002	Zuppero et al.	
		US-		Suppero et al.	
:		US-			
		US-			
		US-			
		US-			<u> </u>
		U9-			<u>-</u>
		US-			
		US-			
]	US-			
		U8-			
	<u> </u>	US-			
		US-			
		US-			
		US-			

		FORE	IGN PATENT D	OCUMENTS		-
Examiner Initials		Foreign Patent Document Caushy Doces - Number - Kind Code * (Firmoun)	Publication Date MM-DD-YYYY	Name of Patentee or	Pages, Columna, Lines, Where Relavant Passages of Relevant Figures Appear	,
						_
						Г
						L
	·					
						_

Exemple on		The second secon
Examiner Signature	Date	
- Signature	Considered	

Any comments of the smooth of time you are required to complete this form should be sent to the Chief information Officer, U.S. Patent and Commissioner for Patents, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINI:R: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw tine through citation if not in conformance and not considered, include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 801.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 8 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. Applicant is to place a check mark here if English language Translation is attached.

Rington Morr Statement: This form is astimuted to take 2.0 hours to complete. These will vary depending upon the passa of the individual area.

PTO/SB/0BA (08-03)
Approved for use through 07/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
as collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a valid OMB control was a collection of information unless it contains a collection of informat inder the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete If Known						
Application Number	10/052,004	_				
Filing Date	1/17/2002	_				
First Named Inventor	Anthony C. Zuppero	_				
Art Unit	1753	_				
Examiner Name	Alan D. Diamond	-				
Attorney Docket Number	22122878-10	丿				

			U.S. PATE	NT DOCUMENTS	
Examiner Initials		Chacument Number Number - Kind Code ² (if known	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant
		us. 4,590,507	05-20-1986	CAPASSO, et al.	Figures Appear
		US_ 4,686,550	708-11-1987	CAPASSO, et al.	
	•	us-4,849,799	07-18-1989	". CAPASSO, et al.	
		us-5,311,009	703-10-1994	CAPASSO, eral.	
		us- 6,084,173	07-04-2000	DIMATTEO	
	نا	US- 6,232,546	05-15-2001	DIMATTEO, et al.	
		US-			
		US-		~ ··	
		US-			
	L	US-			
		US-			
·		us-			
		US-			
		US-			
		US-			
	ļ	US-			
	<u> </u>	นระ			

FOREIGN PATENT DOCUMENTS								
Cite No.1	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	To			
		2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4						

		Cite Foreign Patent Document	Cite Foreign Patent Document Publication Date	Publication Date Name of Petentee or	Cite Foreign Patent Document Publication Date Name of Petentee or Pages, Columns, Lines,			

The same of the sa	
Exeminer	Date
Signature	Considered

*EXAMINER: Initial if reference considered, whether or not cliation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered, include copy of this form with next communication to applicant.

Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.nov or MPEP 901.01. ³ Enter Office that issued the document, by the two-latter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the appropriate symbols as indicated on the document under WIPO Standard ST. 18 if possible. ⁵ Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Petent and Tradelnark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Sbort

PTO/SB/08A (08-03)

	Approved for use through 07/31/2006, OMB 0651-0031
approvork Reduction Act of 1995, no pagence are manifed to a	spond to a collection of information unless it contains a walld CAMP sector
to be seeing and required to re	Spond to a collection of information unless it contains a wall-t out a

Under the P. Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many shoets as necessary) ne

Complete if Known		
Application Number	10/052,004	-
Filling Date	1/17/2002	_
First Named Inventor	Anthony C. Zuppero	_
Art Unit	1753	_
Examiner Name	Alan D. Diamond	
Attorney Docket Number	22122979 10	_

		OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS bedude name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the	_
Examiner Initials	Cite No.1	number(s) midlisher city ending country where number(s) with lisher city ending country where number(s) midlisher city ending country where number(s) midlisher city ending country where number(s) with lisher city ending ci	
		AUERBACH, Daniel J.; "Hitting the Surface-Softly"; Science, 294, (2001), pp. 2488-2489	1
] 	BONDZIE, V. A., et al.; "Oxygen adsorption gold particles TiO2(110)"; J. Vac. Sci. Tech. A., (1999) 17, pp. 1717 and figure 3	1
	L	BOULTER, James; "Laboratory Measurement of OH "; http://pearl1.lanl.gov/wsa2002/WSA2002talks.pdf	1
	,	CHAN H.Y.H., et al.; "Methanol Oxidation On Palladium Compared To Rhodium; J. Catalysis v. 174(#2) pp. 191-200 (1998) (abstract and figure 1 only)	
		CHIANG, TC.; *Photoemission studies of quantum well states in thin films; Surf. Sci. Rpts.39 (2000) pp 181-235	1
		CHUBB, D. L., et al; "Semiconductor Silicon as a Selective Emitter"; http://www.thermopv.org/TPV5-2-05-Chubb.pdf (abstract only)	
		CORCELLI, S. A., et al.; "Vibrational energy pooling in CO on NaCl(100) "; J. Chem. Phys.(2002) 116, pp. 8079-8092	
		DANESE, A., et al.; "Influence of the substrate electronic structure on metallic quantum well"; Prog. Surf. Sci., 67, (2001), pp 249-258	İ
	;	DAVIS, J. B., et al.; "Kinetics and dynamics of the dissociative chemisorption of oxygen on Ir(111)"; J. Chem. Phys. 107 (3), (1997), pp 943-952	Ì
			l

The second secon	- Commence		
Examiner		Date	-
Signature		Considered	

^{*}EXAMINER Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English fanguage Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the Individual case. Any Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

Approved for use through 07/31/2006. OMB 0651-0031

Under the Peperwork Reduction Act of 1995, no persons are required to respond to a collection of information undersity contains a valid OMB control number.

Substitute for the provided to the control of the persons are required to respond to a collection of information undersity contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

	Complete if Known		
	Application Number	10/052,004	
	Filing Date	1/17/2002	
	First Named Inventor	Anthony C. Zuppero	
	Art Unit	1753	
4	Examiner Name	Alan D. Diamond	
_	Attorney Docket Number	122122070 40	

	_	OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
Exami ver Initials	Cite No. 1	Include name of the author (in CAPITAL LETTERS), the of the article (when appropriate), the of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(a), volume-issue number(s), minister city and/or country where nublished.	
] . 	DIEKHONER, L., et al.; "Parallel pathways in methanol Pt(111)"; Surf. Sci. 409 (1998) pp	
		DIESING, D., et al.; "Aluminium oxide tunnel junctions"; Thin Solid Films, Vol. 342 (1-2) (1999) pp. 282-290	
	•	DIMATTEO, R. S., et al.; "Enhanced photogeneration of carriers vacuum gap"; Appl. Phys. Let. (2001) 79, pp. 1894-1896	1
		DIMATTEO, R. S., et al.; "Introduction to and Experimental Demonstration of Micron-gap ThermoPhotoVoltaics"; http://www.thermopv.org/37DiMatteo.html (abstract only)	1
	;	DOGWILER, Urs, et al.; "Two-dimensional catalytically stabilized lean methano-air"; Combustion and Flame, (1999), 116(1,2), pp 243-258	1
ا ا۔۔ا		ECHENIQUE, P. M., et al.; "Surface-state electron dynamics in noble metals"; Prog. Surf. Sci., 67, (2001), pp 271-283	t
		ENDO, Makoto, et al.; "Oxidation of methanol on Pt(111)"; Surf. Sci. 441 (1999) L931-L937, Surf. Sci. Letters	<u> </u>
		FAN, C. Y., et al.; "The oxidation of CO on RuO2"; J. Chem. Phys. 114, (2001), pp. 10058-10062	t
		FANN, W.S., et al.; "Electron thermalization in gold"; Phys. Rev. B (1992) 46 pp. 13592-13595	ŀ
		4	L
 -	\downarrow		
		•	
1		· · · · · · · · · · · · · · · · · · ·	

Examiner .	Date .
Signature	
THE RESERVE AND DESCRIPTION OF THE PERSON NAMED IN COLUMN TWO	Considered

^{*}EXAMINER: killed if reference considered, whether or not citation is in conformance with MPEP 609. Oraw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents,

Sheet

PTC/SB#08A (08-03)

Approved for use through 07/31/2006. OMB 0851-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Ur der the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number. Eubstitute for form 1449/PTO Complete If Клоwn

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Application Number 10/052,004 Filing Date 1/17/2002 First Named Inventor Anthony C. Zuppero Art Unit 1753 Examiner Name Alan D. Dlamond Attorney, Docket Number. 22122878-10

Examiner Initial	Cite No.1	theiude name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), multisher, city and/or country where nublished.	Ī
		GHB, Adam T., et al.; "The dynamics of O2 adsorption on Pt(533)"; J. Chem. Phys. (2000) 113, pp. 10333-10343	T
		GERGEN, Brian, et al.; "Chemically induced Electronic Excitations at Metal Surfaces"; Science, 294, (2001) pp. 2521-2523	
		GULIANTS, Elena A, et al.; "A 0.5-µm-thick polycrystalline silicon Schottky"; Appl. Phys. Let., (2002), 80, pp. 1474-1476	
		GUMHALTER, B., et al.; "Effect of electronic relaxation adsorption reaction rates"; Phys. Rev. B (1984) 30 pp. 3179-3190	l
		HALONEN, Lauri, et al.; "Reactivity of vibrationally excited methane on nickel"; J. Chem. Phys. (2001) 115, pp. 5611-5619	-
		HASEGAWA, Y., et al.; "Modification of electron standing wave Pd; Surf. Sci., in press, 11 April 2002	-
		HBNRY, Claude R.; "Catalytic activity nanometer-sized metal clusters"; Applied Surf. Sci., 164, (2000) pp 252-259	
		HBSS, S., et al.; "Hot Carrier Relaxation Phonon Scattering in GaN"; http://www.physics.ox.ac.uk/rtaylor/images/hot%20carrier%20poster.pdf	-
	. !	HO, Wilson; http://www.lassp.comell.edu/lassp_data/wilsonho.html	┝
			-
	_		

A STATE OF THE PARTY OF THE PAR	
Examiner	
Slangture	Date
Colourante	Considered

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Oraw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[†] Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is allached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, IC 20231.

PTO/SB/08A (08-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a varied OMB control number. Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known Application Number 10/052,004 Filing Date 1/17/2002 First Named Inventor Anthony C. Zuppero Arl Unit 1753 Examiner Name Alan D. Diamond Attorney Docket Number 22122878-10

Constant	OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS Examiliner Cite Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the		
Examiner Initiate	Ote No.1	number(s) publisher, city and/or country where right shed	
		HOHLFELD, J, et al.; "Electron and lattice dynamics" optical excitation of metals"; Chemical Physics, 251 (2000) pp 237-258	
		HONKALA, Karollina, et al.; "Ab initio study of O2 precursor states on the Pd(111)"; J. Chem. Phys. (2001) 115, pp. 2297-2302	_
		HOU, H.; Y., et al.; "Chemical Interactions of Super-Excited Molecules on Metal Surfaces"; http://www2.chem.ucsb.edu/~wodtke/papers/dan1.pdf	-
		HOU, H., et al.; "Direct multiquantum relaxation of highly vibrationally excited NO"; J. Chem. Phys., 110, (1999) pp 10660 - 10663	
		HUANG Y., et al.; "Observation of Vibrational Excitation and Deexcitation for NO from Au(111)"; Phys. Rev. Lett., 84, (2000) pp 2985 - 2988	
		HUANG, Yuhui, et al.; "Vibrational Promotion of Electron Transfer"; SCIENCE, VOL 290, 6 OCTOBER 2000, pp 111 - 113	1
		IBH; "NanoLED overview"; http://www.ibh.co.uk/products/light_sources/nanoled_main.htm	
		IBH; "Red picosecond laser sources"; http://www.ibh.co.uk/products/light_sources/nanoled/heads/red_laser_heads.htm	
		IFTIMIA, Ileana, et al.; "Theory scattering of molecules from surface"; Phys. Rev. B (2002)	1
.			1
			T
	- [

Examiner	Date
Signature	Considered

^{*}EXAMINEF: Initial if reference considered, whether or not challon is in conformance with MPEP 608. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation le attached.

Burden Hour Statement. This form is estimated to the 2.0 hours to complete. Three will very depending upon the needs of the individual case. Any comments (a the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents,

PTO/SB/08A (08-03) Approved for use through 07/31/2006, OMB 0651-0031

II S Datast and Trademod Office to C DEDARTHER TO BE AND THE
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERC
named to a self-self-self-self-self-self-self-self-
espond to a collection of Information unless it contains a valid OMB control number
TOO IT CONTENTS IT VALID OME CONTOUR FIREITE

Complete if Known Susstitute for form 1449/PTO **Application Number** 10/052,004 Filing Date 1/17/2002 **INFORMATION DISCLOSURE** First Named Inventor Anthony C. Zuppero STATEMENT BY APPLICANT Art Unit 1753 (Use as many sheets as necessary) **Examiner Name** Alan D. Diamond Sheet Attorney Docket Number 22122878-10

Examiner	Cite	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the	Т
Initials	No.1	Hem (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s) publisher, city and/or country where published	
	<u> </u> 	ISHIKAWA, Yasuyuki, et al.; "Energetics of H2O dissociation and COads+OHads reaction Pt"; Surf. Sci. preprints SUSC 12830, 27 April 2002	
		JOHNSON, R. Colin; "Molecular substitutionterahertz switch arrays": EE Times, (04/10/00, 3:35 p.m. EST) http://www.eet.com/story/OBG20000410S0057	
		KAO, Chia-Ling, et al.; "The adsorption molecular carbon dioxide on Pt(111) and Pd(111)"; Surf. Sci., (2001) Article 12570	Ì
		KATZ, Gil, et al.; "Non-Adiabatic Charge Transfer Process of Oxygen on metal Surfaces"; Surf. Sci. 425(1) (1999) pp. 1-14	
		KAWAKAMI, R. K., et al.; "Quantum-well states in copper thin films"; Nature, 398, (1999) pp 132-134	
		KOMEDA, T., et al.; "Lateral Hopping of Molecules Induced by Excitation of Internal Vibration"; Science, 295, (2002) pp 2055-2058	Ī
		LEWIS, Steven P., et al.; "Continuum Blastic Theory of Adsorbate Vibrational Relaxation"; J. Chem. Phys. 108, 1157 (1998)	r
		LBWIS, Steven P., et al.; "Substrate-adsorbate coupling in CO-adsorbed copper"; Phys. Rev. Lett. 77, 5241 (1996)	-
	7.	LI, Shenping, et al.; "Generation of wavelength-tunable single-mode picosecond pulses"; Appl. Phys. Let. 76, (2000) pp 3676 - 3678	-
		i,	
····			

Examiner .	Date	
Signature	Considered	•

^{*}EXAMINE 3: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

⁴ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 2023 1. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 2023 1.

Sheet

PTO/SB/08A (08-03)

Approved for use through 07/31/2006. OMB 0851-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Co	mplete if Known	
Application Number	10/052,004	
Filing Date	1/17/2002	
First Named Inventor	Anthony C. Zuppero	
Art Unit	1753	
Examiner Name	Alan D. Diamond	
Attorney Docket Number	22122878-10	

Examiner Initials	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the flow (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-tessue	T
		MITSUI, T., et al.; "Coadsorption and interactions of O and H on Pd(111)"; Surf. Sci., Article 12767, (2002)	
	1	MOULA, Md. Golam, et al.; "Velocity distribution of desorbing CO2 in CO oxidation on Pd(110)"; Applied Surf. Sci., 169-170, pp 268-272 (2001)	
		MULET, Jean-Philippe, et al.; "Nanoscale radiative heat transfer between a small particle"; Appl. Phys. Let., 78, (2001) p 293 1	T
		NIENHAUS, H, et al.; "Direct detection of electron-hole pairs generated by chemical reactions on metal surfaces"; Surf. Sci. 445 (2000) pp 335–342	T
		NIENHAUS, H.; "Electronic excitations by chemical reactions on metal surfaces"; Surf. Sci. Rpts. 45 (2002) pp I - 78	
	1	NIENHAUS, H., et al.; "Selective H atom sensors using ultrathin Ag/Si Schottky diodes"; Appl. Phys. Let. (1999) 74, pp. 4046-4048	T
		NIENHAUS, Hermann; "Electron-hole pair creation by reactions at metal surfaces"; APS, March 20-26, 1999, Atlanta, GA, Session SC33 [SC33.01]	T
		NIENHAUS, H, et al.; "Electron-Hole Pair Creation at Ag and Cu of Atomic Hydrogen and Deuterium"; Phys. Rev. Lett., 82, (1999) pp. 446-449	1
		NOLAN P. D., et al.; "Direct verification of precursor to oxygen dissociation on Pd(i11)"; Surf. Sci. v. 419(#1) pp. L107-L113, (1998)	1
			T
······································	_		
		v .	

Examiner	Date	
Sicnature	Considered	

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique classon designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. This will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTC/SB/08A (08-03)
Approved for use through 07/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under tip Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Complete if Known Substitute for form 1449/PTO **Application Number** 10/052,004 Filing Date 1/17/2002 INFORMATION DISCLOSURE First Named Inventor Anthony C. Zuppero STATEMENT BY APPLICANT Art Unit 1753 (Use as many sheets as necessary) Examiner Name Alan D. Diamond **Attorney Docket Number** 22122878-10 Sheet

		OTHER PRIOR ART — NON PATENT LITERATURE DOCUMENTS Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the	Ţ
Exeminer Initials	Cite No.1	item (book, magazine, journal, serial, sympostum, catalog, etc.), date, page(s), volume-issue number(s) numisher city and/or country where numished.	Ľ
] 1	NOLAN, P. D., et al.; "Molecularly chemisorbed intermediates to oxygen adsorption on Pt"; J. Chem. Phys. 111, (1999), pp 3696 - 3704	
		NOLAN, P. D., et al.; "Translational Precursors to Oxygen Adsorption on Pt(111)"; Phys. Rev. Lett., 81, (1998) pp 3179 - 3182	
		OGAWA, S., et al.; "Optical and Femtosecond Dynamics in Ag/Fe(100) Quantum Wells"; Phys. Rev. Lett. 88, 116801 (2002)	
		PAGGEL, I. J., et al.; "Quantum-Well States as Fabry-Pérot Modes in a"; Science, 283, (1999), pp 1709 - 1711	
		PAGGEL, J. J., et al.; "Quasiparticle Lifetime Ag/Fe(100) Quantum Wells"; Phys. Rev. Lett. (1998) 81, pp. 5632-5635	
· · · ·	1"	PAGGEL, J.J., et al.; "Quantum well photoemission from atomically uniform Ag films"; Applied Surf. Sci., 162-163, (2000), pp 78-85	
	22	RETTNER, C. T., et al; "Dynamics chemisorption of O2 on Pt(111) chemisorbed precursor"; J. Chem. Phys. (1991) 94, pp. 1626-1635 (abstract only)	
	i	RINNEMO, Mats; "Catalytic Ignition and Kinetic Phase Transitions"; 1996; http://www2.lib.chalmers.se/cth/diss/doc/9596/RinnemoMats.html	
		ROBERTSON, A. J. B.; "Catalysis of Gas Reactions by Metals"; Logos Press Limited; 1970; LC # 70-80936; pp. 1-5, 10, 41; Great Britain, Adlard & son Ltd	
		·	
	_		1
•			ı

Examiner	Date
Signature	Considered

Burden How Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademerk Office, Wishington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINIER: Initial In reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not exhaldered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to ptace a check mark here if English language Translation is attached.

Substitute for form 1449/PTO

PTO/SB/08A (08-03)

Approved for use through 07/31/2006, OMB 0851-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary) of.

Co.	mplete if Known
Application Number	10/052,004
Filing Date	1/17/2002
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-10

Examiner Initials	Cite No.1	OTHER PRIOR ART — NON PATENT LITERATURE DOCUMENTS Include name of the author (in CAPITAL LETTERS), title of the stitcle (when appropriate), title of the from (book, magazine, journal; serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where outsitished.	T
	·	SCHEWE, P., et al.; "CO2 Production at the Single-Molecule Level"; http://www.aip.org/enews/physnews/2001/split/561-1.html	t
		SHENG, H., et al.; "Schottky diode with Ag on (110) epitaxial ZnO film"; Appl. Phys. Let. (2002) 80, pp. 2132-2134	ļ
	•	SMIT, G. D. J., et al.; "Enhanced tunneling across nanometer-scale metal-semiconductor interfaces"; Appl. Phys. Let. (2002) 80, pp. 2568-2570	-
		SNOW, E. S., et al.; "Ultrathin PtSi layers patterned by scanned probe lithography"; Appl. Phys. Let. (2001) 79, pp. 1109-1111	-
		STIPB, B. C., et al.; "Atomistic studies of O2 dissociation on Pt(111) induced by photons"; J. Chem. Phys., (1997) 107 pp. 6443-6447	
		SUN, CK., et al.; "Femtosecond studies of carrier dynamics in InGaN"; Appl. Phys. Let. (1997) 70 pp. 2004-2006	ŀ
		SVENSSON, K., et al.; "Dipole Active Vibrational Motion in the Physisorption Well"; Phys. Rev. Lett., 78, (1997) pp 2016-2019	ŀ
		TARVER, Craig M.; "Non-Equilibrium Chemical Kinetic Explosive Reactive Flows"; Fall 1999 IMA Workshop: High-Speed Combustion in Gaseous and Condensed-Phase	
	,	TAYLOR, R.A., et al.; "Strong Electron-LO Phonon Scattering and Hot Carrier Relaxation in GaN"; http://www.physics.ox.ac.uk/rtaylor/images/ha249kw3.pdf	

Examiner	Date	
Signature		•
Sidia dia	Considered	•

^{*}EXAMINER: initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered, include copy of this form with next communication to applicant.

Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any Office, Washington, DG 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, CG 20231.

Approved for use through 07/31/2006, OMB 0651-0031 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE Substitute for form 1449/PTO Application Number PTO/SB/88A (08-03) Approved for use through 07/31/2006, OMB 0651-0031 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE Complete if Known Application Number Filing Date 1/17/2002 INFORMATION DISCLOSURE First Named Inventor Anthony C. Zuppero STATEMENT BY APPLICANT Art Unit 1753 (Use as many sheets as necessary) Examiner Name Alan D. Diamond 22122878-10 **Attorney Docket Number** Steet

Examiner Initials	Cite No.1	include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(e), volume-issue mumber(s), muhiisher, city and/or country where muhiished	7
	 	TEODORESCU, C.M., et al.; "Structure of Fe layers grown on InAs"; Appl. Surf. Sci., 166, (2000) pp 137-142	
		TIUSAN, C., et al.; "Quantum coherent transport versus diode-like effect in"; Appl. Phys. Let. 79, (2001) pp 4231-4233	
		TRIPA, C. Emîl, et al.; "Surface-aligned photochemistry: Aiming reactive oxygen atoms"; J. Chem. Phys., (2000) 112 pp. 2463-2469	
		TRIPA, C. Emil, et al.; "Surface-aligned reaction of photogenerated oxygen atoms with"; Nature 398, pp 591 - 593 (1999)	
		TRIPA, C. Emil; *Special Adsorption and Reaction Effects at Step Defect Sites on Platinum"; http://www.chem.pitt.edu/thesis.html#tripa (abstract only)	
		VOLKENING, S., et al.; "CO oxidation on Pt(111)—Scanning tunneling microscopy experiments"; J. Chem. Phys. (2001) 114, pp. 6382-6395	
		WATSON, D.T.P., et al.; "Isothermal and temperature-programmed oxidation of CH over Pt"; Surf. Sci. preprint, year 2001	-
	7;	WATSON, D.T.P., et al.; "Surface products of the dissociative adsorption of methane on Pt"; Surf. Sci. preprint, c. October 2001	
		·	
			Ī
			ı

		_
Examiner	Date	
Slandure	Considered	
CAN INDIA	T Considered	_

^{*}EXAMINE 3: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered, include copy of this form with next communication to applicant.

Applicant's unique ditation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Ho it Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTO/SB/08A (08-03)
Approved for use through 07/31/2008. OMB 0851-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of Information unless it contains a valid QMB control number.

Complete If Known Substitute for form 1449/PTO **Application Number** 10/052,004 Filing Date 1/17/2002 INFORMATION DISCLOSURE First Named Inventor Anthony C. Zuppero STATEMENT BY APPLICANT 1753 Art Unit (Use as many sheets as necessary) Alan D. Diamond Examiner Name 22122878-10 **Attorney Docket Number**

Examiner Initials	Cita No.1	Include name of the author (in CAPITAL LETTERS), title of the stilicle (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-tasue number(s), ethilisher, city and/or country where number(s) ethilisher, city and/or country where number(s).	T
		WILKB, Steffen, et al.; "Theoretical investigation of water formation on Rh and Pt Surfaces"; J. Chem. Phys., 112, (2000) PP 9986 - 9995	
		WINITERLIN, J, et al; "AtomicReaction Rates Surface-Catalyzed"; Science, 278, (1997) pp. 1931 - 1934	
		WINTTERLIN, J, R., et al.; "Existence of a "Hot" Atom Mechanism for the Dissociation of O2 on Pt(111)"; Phys. Rev. Lett., 77, (1996), pp 123 - 126	
		ZAMBELLI, T., et al.; "Complex pathways in dissociative adsorption of oxygen on platinum"; Nature 390, pp 495 - 497 (1997)	
		ZHDANOV, V.P., et al.; "Substrate-mediated photoinduced chemical reactions on ultrathin metal films"; Surf. Sci., V. 432 (#3) pp L599-L603, (1999)	
		ZHDANOV, Vladimir P.; "Nm-sized metal particles on a semiconductor surface, Schottky"; Surf. Sci. PROOF SUSC 2931, 20 April 2002	
	₹·.	ZHUKOV, V. P., et al.; "Lifetimes of quasiparticle excitations in 4d transition metals"; Phys. Rev. B (2002) 65, Article 115116	
		1	_
		·	
			ĺ

The same of the sa	ويواري الناب والنازي والنواز والمواري والمواري والمواري والمواري والموارية والمارك والمارك والمارك والمارك والم		
Examiner	•	Date	
Signature		Considered	

^{*}EXAMINEIX Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique distion designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. The will vary depending upon the needs of the individual case. Any comments in the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Petent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTO/SB/08A (08-03)
Approved for use through 07/31/2006. OMB 0851-0031
U.S. Patent and Trademerk Office; U.S. DEPARTMENT OF COMMERCE to a collection of information unless it contains a yaild OMB control number.

Inder the Paperw	ork Reduction Act of 1995, no persons are required	to respond to a collection of informa	ition unless it contains a valid OMB cont	rol number		
Substitute for form 1449/PTO		Complete if Known				
		Application Number	10/052,004			
INFORMATION DISCLOSURE		Filing Date	1/17/2002	,		
		First Named Inventor	Anthony C. Zuppero			
STATEMENT BY APPLICANT (Use as many sheets as necessary)		Art Unit	1753			
		Examiner Name	Alan D. Diamond			
201		Attorney Docket Number	22122878-10			

Examiner	Cite No.	Document Number	U. S. PATEN Publication Date		Name of Palentee or	Pages, Columns, Lines, Whe Relevant Passages or Releva	тe
nitials"	No.'	Number-Kind Code ² ff farmer	MM-DO-YYYY	Abit	dicant of Cited Document	Relevant Passages or Releva Figures Appear	int
	┢ ; ⁴	Nonper-Grad Code	╁	<u>-</u>			_
	<u> </u>						_
	<u>-</u>		<u> </u>				_
	 -	USi-5932885	08-1999	DeBellis (et al.		_
		 	- <u>!</u>	· · · · · ·			_
	├			 			-
	-		· •	•		<u> </u>	
	 	1.	<u> </u>	-			
		US-2001/0018923-A1	09-2001	Zuppero	et at		_
	 -	00F2001/0010823-A1	08-2001	Zuppero	ot di.		
 	 						_
	- .	•	•			·	_
	╁╌╌	US-2002/0121088-A1	1 09-2002	Zuppero	et al.		
	 -		.	1			
	┢.	w		<u> </u>			
	 	13.7	 				
		:\"	<u> </u>				_
		··					-
							_
Examiner	Cite	For sign Patent Document	FOREIGN PA	TENT DOCU Publication	MENTS Name of Patentee or	Pages, Columns, Lines.	Т
initials"	Cite No.			Date (I-DD-YYYY	Applicant of Cited Document	Pages, Columns, Unes, Where Relevant Passages Or Relevant Figures Appear	l
	<u> </u>	Country Code ³ Number ¹ Kind Code ⁵ (# /	known)	YP-00-1111		Or Relevant Figures Appear	L
			·			<u> </u>	<u>L</u>
	1						
					•		L
							ľ
Evaminar			· · · · · · · · · · · · · · · · · · ·		Data		

		· ·
Examiner Signature	Date Considered	

*EXAMINER: thitial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. Applicant's unique citation designation number (optional). See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 801.04. Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Shept

PTO/SBA98A (08-03)
Approved for use through 07/31/2006. OMB 0551-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known						
Application Number	10/052,004					
Filling Date	1/17/2002					
First Named Inventor	Anthony C. Zuppero					
Art Unit	1753					
Examiner Name	Alan D. Diamond					
Attorney Docket Number	22122878-10					

		include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the	T2
nitials*	CRe No.1	item (book, magazine, journal, sarjal, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	Ĺ
-		REE, J. et al., "Dynamics of Gas-Surface Interactions: Reaction of Atomic Oxygen with Chemisorbed Hydrogen on TUNGSTEN,"	h
		Journal of Physical Chemistry, Vol. 101 (#25), pp. 4523 - 4534, June 19, 1997.	
-		REE, J. et al., "Reaction of atomic oxygen with adsorbed carbon monoxide on a platinum surface," Journal of Chemical	
		Physics, Vol. 104, Issue 2, pp. 742 - 757, January 8, 1996.	
		NOLAN, P.D. et al., "Molecularly chemisorbed intermediates to oxygen adsorption on Pt(111): A molecular beam and electron	
		energy-loss spectroscopy study," Journal of Chemical Physics, Vol. 111, No. 8, pp. 3696 - 3704, August 22, 1999.	
		NOLAN, P. D. et al., "Translation Energy Selection of Molecula Precursors to Oxygen Adsorption on Pt (111)," Physical Review Letters, Vol. 81, No. 15, pp. 3179 - 3182, October 12, 1998.	L
:		MURPHY, M. J. et al., "Inverted vibrational distributions from N2 recombination at Ru(001): Evidence for a metastable molecular chemisorption well," Journal of Chemical Physics,	n
		Vol. 110, No. 14, pp. 6954 - 6962, April 8, 1999.	
		KIM, M. S. et al., "Reaction of Gas-Phase Atomic Hydrogen witl Chemisorbed Hydrogen Atoms on an Iron Surface," Bull. Korean Chem. Soc., Vol. 18, No. 9, pp. 985 - 994, May 22, 1997.	h
		BONN, M. et al., "Phonon-Versus Electron-Mediated Desorption and Oxidation of CO on Ru(0001)," Science, Vol. 285, pp. 1042 - 1045, August 13, 1999. www.sciencemag.org	

بخصيب سيجي	والمراجع والم		
Examiner		Date	\
Signature		Considered	

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief information Officer, U. S. Petent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. 2 Applicant is to place a check mark here if English language Translation is attached.

PTO/SB/08A (08-03) Approved for use through 07/31/2008. OMB 0651-0031

	U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERC
Under the Paperwork Reduction Act of 1995, no persons are requ	ired to respond to a collection of information unless it contains a valid OMB control number
Substitute for form 1449/PTO	Complete if Known

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known					
Application Number	10/052,004				
Filing Date	1/17/2002				
First Named Inventor	Anthony C. Zuppero				
Art Unit	1753				
Examiner Name	Alan D. Diamond				
Attorney Docket Number	22122878-10				

	,	OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
Examiner Initials	Cão No.¹	Include name of the author-(in CAPITAL LETTERS), the of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city end/or country where published.	12
	-	NOLAN, P. D. et al., "Direct verification of a high-	1
···-		translational-energy molecular precursor to oxygen dissociation Pd(111)," Surface Science Letters, Vol. 419, pp. L107 -	da
		L113, September 24, 1998.	
,		DAVIS, J. E. et al., "Kinetics and dynamics of the dissociation chemisorption of oxygen on Ir(111)," Journal of Chem. Phys., Vol. 107(3), pp. 943 - 952, July 15, 1997.	ve
		TRIPA, C. Emil et al., "Surface-aligned reaction of photo- generated oxygen atoms with carbon monoxide targets," Nature, Vol. 398, pp. 591 - 593, April 15, 1999, www.nature.com.	
		SHIN HK, "Vibrationally excited OD Radicals from the Reaction of Oxygen-Atoms with Chemisorbed Deuterium on TUNGSTEN,"	
		Journals of Physical Chemistry, Vol. 102(#13), pp. 2372 - 2380, March 26, 1998.	
-	:	TRIPA, C. Emil et al., "Kinetics measurements of CO photo-oxidation on Pt(111)," Journal of Chemical Physics, Vol. 105,	
		Issue 4, pp. 1691 - 1696, July 22, 1996.	T
		·	-
			+
			1

Examiner			
	•	Date	
Signa.ure			
		Considered	

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U. S. Palent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. 2 Applicant is to place a check mark here if English language Translation is attached.

PTO/SB/08A (09-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Uncer the Paperwo	ork Reduction Act of 1995, no persons are required to	o respond to a collection of Informa	tion unless it contains a valid OMB contro	<u>1 numbe</u>	
Substitute for form	n 1449/PTO	Complete if Known			
GIBBOOK ICH IOTH 14401 10		Application Number	10/052,004		
INCORR	IATION DISCLOSURE	Filing Date	1/17/2002		
		First Named Inventor	Anthony C. Zuppero		
STATE	MENT BY APPLICANT	Art Unit	1753		
{Use	as many sheets as necessary)	Examiner Name	Alan D. Diamond		
1991	of	Attorney Docket Number	22122878-10		

Sne	<u> </u>		l Of i		may Booker Hamber	
				U.S. PAIENT DUGG	MENIS	
xaminer nklais*	Cite No.1	U.S. Patent Number	Kind Code ²	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Releyant Passages or Releyant Figures Appear
		3,694,77	70	Burwell et al.	09/26/1972	
				······		
		•			-	· · · · · · · · · · · · · · · · · · ·
			 			
	ļ				_ 	
	 					·
				 		,
		 				
	 					
		<u> </u>				
	ļ					
i	ł	1				<u> </u>

Examiner		F	oreign Patent Docu	ment	Name of Patentee or	Date of Publication of	Pages, Columns, Unes, Where Relovens	
initials*	Cite No.'	Office ³	Number ⁴	Kind Code ⁵ (#known)	Applicant of Cited Document	Cited Document - MM-DD-YYYY	Passages or Relevant Equipment Appear	7,
		DT	1,230,509		Bleekrode et al.	12/15/1966	Abstract	X
								1:
	 -	 				 		╁╴
								1

مسعب سعدانان		
Examiner	Date	
Signature	Considered	

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT 3END FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique dilation designation number. ² See attached Kinds of U.S. Patent Documents. ³ Enter Office that issued the document, by the two-letter code (Will'O Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Transfation is attached.

PTO/SB/08A (08-03)

	Approved	ı ror use	mrou	gn 07/31/2006.	OWR 0821-0031
a	Trademade	Office: I	10 0	SEDARTMENT	OC COMMEDAE

U.S. Patent and Under the Paperwork Reduction Act of 1995, no persons are regulaed to respond to a collection of information unless it contains a valid OMB control number.

Substilute for fo	orm 1449/PTO	Flist Named Inventor Anthony C. Zup	mplete if Known
		Application Number	10/052,004
INFOR	MATION DISCLOSURE	Filing Date	1/17/2002
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		First Named Inventor	Anthony C. Zuppero
		Art Unit	1753
		Examiner Name	Alan D. Diamond
		Attorney Docket Number	22122878-10

	U.S. PATENT DOCUMENTS						
Exambrer	Clts	U.S. Pater	d Occument		Date of Publication of	Pages, Columns, Lines,	
nitials'	No.1	Number	Kind Code ² (#known)	Name of Patentee or Applicant of Cited Document	Cited Document MM-DD-YYYY	Where Relevant Passages or Relevant Figures Appear	
	-∹						
	- $+$						
		····			·		
							
				·			
						· · · · · · · · · · · · · · · · · · ·	
				~ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			
					_		
~		· · · · · · · · · · · · · · · · · · ·		·			
			 			 	
	——					·····	
							
						······································	
				· · · · · · · · · · · · · · · · · · ·			
						·	

				FORE	IGN PATENT DOCUMENT	T\$		_
Examiner	Cl:e		Foreign Patent Docu	ment	Name of Patentee or	Date of Publication of	Pages, Columns, Lines,	
Initiale*	No.1	Office ³	Number ⁴	Kind Codes (if known)	Applicant of Cited Document	Cited Document MM-DD-YYYY	Where Relevant Passages or Relevant Figures Appear	T°
	:_	WO	01/28677	AL	NeoKismet L.L.C.	04-26-2001	*	
· · ·		wo	00/72384	AL	NeoKismet L.L.C.	11-30-2000	, .	
	<u> </u>	NL	1,065,463		Philips Electronic Ltd.	04-12-1967		
					<u></u>	-		-
								4
		 	·			-		-
			······································			1	······································	

Examine	:	Date	
	·	Date	i e
· Signaturo		Considered	
		Constabled	

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any commenta on the amount of time you are required to complete this form should be sent to the Chief information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SENO FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. ² See attached Kinds of U.S. Petent Documents. ³ Enter Office that issued the document, by the two-letter code (WIPO 5 tandard ST.3). ⁴ For Japanese patent documents, the Indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English tanguage Translation is attached.

PTO/SB/08A (08-03)

Approved for use through 07/31/2008. OMB 0851-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number. Substitute for form 1449/PTO Application Number 10/052,004 1/17/2002 Filino Date INFORMATION DISCLOSURE First Named Inventor Anthony C. Zuppero Art Unit

STATEMENT BY APPLICANT 1753 Alan D. Diamond (Use as many sheets as necessary) Exeminer Name Attorney Docket Number 22122878-10 Sheet OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the Rem (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), Daminer Cite Inhlafe No.1 publisher, city and/or country where published. G.H. TAKAOKA et al., "Preparation and catalytic activity of nano-scale Au islands supported on Ti02" Nuclear Instruments & Methods in Physics Research, Section - B: Beam Interactions with Materials and Atoms, North-Holland Publishing Company, Amsterdam, NL, Vol. 121, No.1, 1997, pages 503-506, XP004057973, abstract. P. AVOURIS et al., "Blectron-Stimulated Catalysis Device", IBM Technical Disclosure Bulletin, Vol. 25, No. 12, May 1, 1983, pages 6378-6379, New York, US, XP002219954.

Examiner	Date
Signature	Considered

¹ Unique et ation designation number. 2 Applicant is to place a check mark here if English language Translation is attached.



Burden Ho it Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231.

DO NOT. SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered include copy of this form with next communication to applicant.

PTO/SB/08A (08-03)
Approved for use through 07/31/2006. OMB 0651-0031

Attorney Docket Number 22122878-10

Under the Paperwork Reduction Act of 1995, no persons are required	to respond to a collection of inform	remark Omos; U.S. DEPARTMENT OF COMMERC! nation unless it contains a valid OMB control number			
Substitute for form 1449/PTO	Complete if Known				
	Application Number	10/052,004			
INFORMATION DISCLOSURE	Filing Date	1/17/2002			
	First Named Inventor	Anthony C. Zuppero			
STATEMENT BY APPLICANT (Use as many shaets as necessary)	Art Unit	1753			
	Examiner Name	Alan D. Diamond			

	-					
				U.S. PATENT DOCL	IMENTS	· ·
Examiner Initials*	CRe No.1	U.S. Patent Number	Nind Code ¹ (If known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cred Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	$\equiv \cdot \perp$	5,651,83	8'	Fraas et al.	07-29-1997	
		5,932,88		DeBellis et al.	08-03-1999	·
	·]	4,753,57	9	Murphy	06-28-1988	
_		5,525,04	1	Deak	06-11-1996	
		5,299,42	2	Nakagawa et al.	04-05-1994	
		5,317,87	6	Nakagawa et al.	06-07-1994	
						·
					·	
				<u> </u>		
				<u> </u>		
	-					
						
			1 1		1	

				FORE	IGN PATENT DOCUMENT	rs		
Examiner	(Жe	F	oreign Palent Do		Name of Patentee or	Date of Publication of	Pages, Columns, Lines,	
nitials*	mer tale trained in attended in			plicant of Cited Document Cited Document Passages or Re	Passages or Relevant Figures Appear	To		
					<u></u>		•	
			-				-,	T
								1
								1
								Π
								1
								\mathbf{I}
								T
								T
					•			

Examiner	Date	•
Signature	Considered	,

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the Individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 608. Draw line through citation is not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. 2 See attached Kinds of U.S. Patent Documents. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. 5 Applicant is to place a check mark here if English language Translation is attached.

PTC/SB/08A (08-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

		Complete if Known				
Substitute for for	m 1449/PTO	Application Number	10/052.004			
INICODA	ATION DISCLOSURE	Filing Date	1/17/2002			
	NATION DISCLOSURE	First Named Inventor	Anthony C. Zuppero			
STATEMENT BY APPLICANT (Use as many sheets as necessary)		Art Unit	1753			
		Examiner Name	Alan D. Diamond			
heet	of	Attorney Docket Number	22122878-10			

"Electron-hole pair creation by reactions at metal surfaces", downloaded from www.aps.org/meet/CBNT99/BAPS/abs/786980001.html American Physical Society Centermical Meeting Program, Atalanta, GA, 20-26 March 1999 "Electron-Hole Pair Creation at Ag and Cu Surfaces by Adsorption of Atomic Hydrogen and Deuterium", Physical Review Letters, Volume 82, Number 2. 11 January 1999 "The Solarex Guide to Solar Electricity" Solarex Corporation, Inc. Frederich, MD, pp. 66-67, April 1979	Examiner initials	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the flem (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	72
Physical Review Letters, Volume 82, Number 2. 11 January 1999			www.aps.org/meet/CENT99/BAPS/abs7S6980001.html	
"The Solarex Guide to Solar Electricity" Solarex Corporation, Inc. Frederich, MD, pp. 66-67, April 1979			"Electron-Hole Pair Cteation at Ag and Cu Surfaces by Adsorption of Atomic Hydrogen and Deuterium", Physical Review Letters, Volume 82, Number 2. 11 January 1999	
		,	"The Solarex Guide to Solar Electricity" Solarex Corporation, Inc. Frederich, MD, pp. 66-67, April 1979	
			·	
	•			T
	,			
	•			
	•			1
				1
1 1	,			
		L		

Signature Considered

*EXAMINE 7: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered, include copy of this form with next communication to applicant.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

⁴ Unique disation designation number. ² Applicant is to place a check mark here if English language Translation is attached.

PTO/SB/08A (08-03) Approved for use through 07/31/2006. OMB 0851-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Reduction Act of 1995, no persons are regulated to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO		Complete if Known		
Substitute for form	1449/PTO	Application Number 10/052,004 Filling Date 1/17/2002 First Named Inventor Anthony C. Zuppero Art Unit 1753		
	TION DIGGLOCUEE	Filing Date	1/17/2002	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		First Named Inventor	Anthony C. Zuppero	
		Art Unit	1753	
		Examiner Name	Alan D. Diamond	
		Attorney Docket Number	22122878-10	

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS include name of the author (in CAPITAL LETTERS), tille of the article (when appropriate), tille of the Examiner Che item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), Initials No.1 publisher, city and/or country where published. FRESE, et al., "Analysis of Current/Voltage Curves at n-Si/SiO_/Pt Electrodes", J. Electrochem. Soc., December 1994, pp. 3375-3382, Vol. 141, No. 12, The Electrochemical Society, Inc. FRESE, et al., "Methanol Oxidation at p-Si/Pt Electrodes, Evidence for Hot Hole Reactivity", J. Phys. Chem., 1995, pp. 6074-6083, Vol. 99, American Chemical Society. GADZUK, "Multiple Electron Processes in Hot-Electron Femtochemistry at Surfaces". http://www.cstl.nist.gov/div837/837.03/highlite/gadzuk1999.htm. FRESE, et al., "Hot Electron Reduction at Etched n-Si/Pt Thin Film Electrodes", J. Electrochem. Soc., September 1994, pp.2402-2409, Vol. 103, The Electrochemical Society Inc. GAILLARD, et al., "Hot Electron Generation in Aqueous Solution at Oxide-Covered Tantalum Electrodes, Reduction of Methylpyridinium and Blectrogenerated Chemiluminescence of Ru(bpy), 24m, J. Phys. Chem., 1999, pp.667-674, Vol. 103, American Chemical Society. SUNG, et al., "Demonstration of Electrochemical Generation of Solution-Phase Hot Electrons at Oxide-Covered Tantalum Electrodes by Direct Electrogenerated Chemiluminescence", J. Phys. Chem., 1998, pp. 9797-9805, Vol. 102, American Chemical Society. ZHDANOV, et al., "Substrate-mediated photoinduced chemical reactions on ultrathin metal films", Surface Science, 1999, pp. L599-L603, Vol. 432, Elsevier Science B.V.

Examiner		Date	
Signature	•	Considered	j
		Considered	1

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will very depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademerk Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINET: Initial if reference considered, whether or not cliation is in conformance with MPEP 609. Draw line through cliation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. 2 Applicant is to place a check mark here if English language Translation is attached.

PTO/SB/08A (08-03)
Approved for use through 07/31/2006. OMB 0851-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Co	mplete if Known
Application Number	10/052,004
Filing Date	1/17/2002
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-10

			U.S. PATE	NT DOCUMENTS	
Exeminer miliais		Document Number Number - Kind Code ² (If known	Publication Date	Name of Palentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant
	.	US- 6,232,546	05-15-2001	DiMatteo et al.	Figures Appear
		US- 6.396,191	03728/2002	Hagelstein et al.	
		us- 5,057,162	1W15/1991	Nelson	
	.]	us- 5,593,509	01/14/1997	Zuppero et al.	
		U9-			
	·	US-			
		US-			
]		US-			
		US-			
		us_			
		US-			
		U8-	·····	· · · · · · · · · · · · · · · · · · ·	
		US-			
[US-			
]	US-			
[I	US-			
	T	US-			

		FORE	IGN PATENT D	OCUMENTS .	
Examiner initials	Cite No.1	Foreign Patent Document County Code 3 - Number 4 - Kind Code 9 (Fishoun)	Publication Date MM-DD-YYYY	Name of Patentee or	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

Examiner Signature	Date
Gigitatule	Considered

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Commissioner for Patents, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINIER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformation and not considered, include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. 2 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. 8 Applicant is to place a check mark here if English language Translation is attached.

Surden Hour Statement: The form is certificated to take 3.0 hours to compete a Time will used depending upon the reade of the individual case.

Under the Paperw	vork Reduction Act of 1995, no parsons are requi	App U.S. Patent and Trade red to respond to a collection of informs	PTO/SE/08A (08-03 proved for use through 07/31/2008, 0MB 0851-003 prank Office: U.S. DEPARTMENT OF COMMERCE ation unless it contains a valid OMB control number
Substitute for for		Co	mplete if Known
		Application Number	10/052,004
INFORM	MATION DISCLOSURE	Filing Date	1/17/2002
		First Named Inventor	Anthony C. Zuppero
	WENT BY APPLICANT	Art Unit	1753
(Use as many sheets as necessary)		Examiner Name	Alan D. Diamond
Sheet of		Attorney Docket Number	22122878-10

		OTHER PRIOR ART — NON PATENT LITERATURE DOCUMENTS	
Examiner Initials	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, calalog, etc.), date, page(a), volume-issue number(s), publisher, city and/or country where published.	12
		MAHAN, G. D. et al., "Multilayer thermionic refrigerator and generator," Journal of Applied Physics, Vol. 83, No. 9, 1 May 1998.	
		STIPE, B. C. et al., "Atomistic studies of O2 dissociation on Pt(111) induced by photons, electrons, and by heating," J. of Chem. Phys., Vol. 107 (16), October 22, 1997, pp. 6443 - 6447.	
		TRIPA, C. E. et al., "Surface-aligned reaction of photogenerated oxygen atoms with carbon monoxide targets," Nature, Vol. 398, 15 April 1999, pp. 591 - 593.	
·			
		•	
Examine Signatur		Date Considered	

Considered

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief information Officer, Patent and Trademark Office, Washington, DC 20231, DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique citation designation number. 2 Applicant is to place a check mark here if English language Translation is attached.

Substitute for form 1449/PTO

PTC/SB/08A (08-03)

Approved for use through 07/31/2006, OMB 0651-0031

U.S. Patent and Trademerk Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known				
Application Number	10/052,004			
Filing Date	1/17/2002			
First Named Inventor	Anthony C. Zuppero	*		
Art Unit	1753			
Examiner Name	Alan D. Diamond			
Attomey Docket Number	22122878-10			

	OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS		
Examiner Initials	Cite No.1	Include name of the author (in CAPITAL LETTERS), litle of the article (when appropriate), litle of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	12
		BONN, M. et al., "Phonon-Versus Electron-Mediated Desorption and Oxidation of CO on Ru(0001)," Science, Vol. 285, No. 5430, Issue of 13 August 1999, pp. 1042-1045.	
-		DAVIS, J. E. et al., "Kinetics and dynamics of the dissociative chemisorption of oxygen on Ir(111)," J. Chem. Phys., 107 No. 3, 15 July 1997, pp. 943-951.	
		GADZUK, J. W., "Hot-electron femtochemistry at surfaces: on the role of multiple electron processes in desorption," Chemical Physics, Vol. 251, year 2000, pp. 87-97.	
		GADZUK, J. W., "Resonance-assisted hot electron femtochemistry at surfaces," Physical Review Letters, May 27, 1996, Vol. 76, Issue 22, pp. 4234-4237.	
		GB, NH. et al., "Femtosecond Dynamics of Electron Localization at Interfaces," Science, Vol. 279, No. 5348, Issue of 9 Jan 1998, pp. 202-205.	
		GAO, Shiwu, "Quantum kinetic theory of vibrational heating and bond breaking by hot electrons," Physical Review B, Vol. 55, No. 3, 15 Jan 1997-I, pp. 1876-1886.	
		HOU, H. et al., "Enhanced Reactivity of Highly Vibrationally Excited Molecules on Metal Surfaces," Science, Vol. 284, No. 5420, Issue of 4 Jun 1999, pp. 1647-1650.	
		NIENHAUS, H. et al., "Direct detection of electron hole pairs generated by chemical reactions on metal surfaces," Surface Science 445 (2000) pp. 335-342.	Y-
		NIENHAUS, H. et al., "Selective H atom sensors using ultrathin Ag/Si Schottky diodes," Applied Physics Letters, June 28, 1999, Vol. 74, Issue 26, pp. 4046-4048.	
	33	GAILLARD, Frederic et al., "Hot electron generation in aqueous solution at oxide-covered tantalum electrodes. Reduction of methylpyridinium and electrogenerated chemiluminescence of Ru(bpy)32+," Journal of Physical Chemistry B., Vol. 103, No. 4, January 28 1999, pp. 667-74.	
	. 1	ENGSTROM, Ulrika and RYBERG, Roger, "Comparing the vibrational properties of low-energy modes of a molecular and an atomic adsorbate: CO and O on Pt (111)," Journal Of Chemical Physics, Vol. 112, No. 4, 22 January 2000, pp. 1959-1965.	•

Examiner	<i>,</i>	Date 1	
Classins	4	Date	<i>'</i>
Signature	<u> </u>	Considered	<i>i</i>
	V	00110123.22	

¹ Unique citation designation number. ² Applicant is to place a check mark here if English language Translation is attached.



Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Oraw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Substitute for form 1449/PTO

PTO/SB/08A (08-03)
Approved for use through 07/31/2006. OMB 0851-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Application Number 10/052,004

Filing Date 1/17/2002

First Named Inventor Anthony C. Zuppero
Art Unit 1753

Examiner Name Alan D. Diamond

Attorney Docket Number 22122878-10

Complete if Known

		OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No.1	include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the tem (book, magazine, journal, serial, symposhim, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	12
	-	NOLAN, P. D. et al., "Molecularly chemisorbed intermediates to oxygen adsorption on Pt (111): A molecular beam and electron energy-loss spectroscopy study," Journal Of Chemical Physics,	
	•	Vol. 111, No. 8, 22 August 1999.	
		NOLAN P. D. et al., "Direct verification of a high- translational-energy molecular precursor to oxygen dissociation on Pd(111), "Surface Science Vol. 419,	
		pp. L107-L113, December 24, 1998.	
		OTTO, Andreas et al., "Role of atomic scale roughness in hot electron chemistry," Journal of Physical Chemistry B, Vol. 103, No. 14. April 8, 1999, pp. 2696-2701.	
		PLIHAL, M. et al., "Role of intra-adsorbate Coulomb correlations in energy transfer at metal surfaces," Physical Review B, Vol. 58, No. 4, July 15, 1998, pp. 2191-2206.	
		SUNG, Yung-Eun et al., "Enhancement of electrochemical hot electron injection into electrolyte solutions at oxide-covered tantalum electrodes by thin platinum films," Journal of	
		Physical Chemistry B., Vol. 102, No. 49, December 3 1998, pp. 9806-11.	
	·	ZHDANOV, V. P. et al., "Substrate-mediated photoinduced chemical reactions on ultrathin metal films." Surface Science, Vol. 432 (#3), pp. L599-L603, July 20, 1999.	
		NIENHAUS, H., "Electron-hole pair creation by reactions at "metal surfaces," American Physical Society, Centennial Meeting Program, March 20-26, 1999, Atlanta, GA, Session SC33 - Metal Surfaces: Adsorbates. http://www.aps.org/meet/CENT99/BAPS/	
	† .	NIENHAUS, H et al., "Electron-Hole Pair Creation at Ag and Cu Surfaces by Adsorption of Atomic Hydrogen and Deuterium," Physical Review Letters, Vol. 82, Issue 2, January 11, 1999, pp. 446-449.	

Examir.er	Date
Signature	Considered

Unique diation designation number. ² Applicant is to place a check mark here if English language Translation is attached.



Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the Individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Petent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

PTO/SB/0BA (08-03)
Approved for use through 07/31/2006. OMB 0651-0031 stent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

	U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERC
Index the Descript Deduction Act of 1005, no namena are required to re	spond to a collection of information unless it contains a valid OMB control number
moer the Paperwork Reduction Act of 1993, no persons are 1940med to te	sports to a consection of information traces a contracts a valid Office contact number

Substitute for form 1449/PTO	Co	mplete if Known
	Application Number	10/052,004
INFORMATION DISCLOSI	Filing Date	1/17/2002
INFORMATION DISCLOSURE	Litat Mained myentor	Anthony C. Zuppero
STATEMENT BY APPLICA	Art Unit	1753
(Use as many sheets as necessary)	Examiner Name	Alan D. Diamond
Shaet of	Attorney Docket Number	22122878-10

Examiner	Cits	OTHER PRIOR ART — NON PATENT LITERATURE DOCUMENTS Include name of the author (in CAPITAL LETTERS), litle of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T2
Initiats*	No.1	publisher, city and/or country where published. DIESING, D. et al., "Aluminium oxide tunnel junctions: influence of preparation technique, sample geometry and oxide thickness," Thin Solid Films, 342 (1999), pages 282-290, received 26 February 1998; accepted 11 September 1998.	+
		·	
-			2
	-		+
Examin		Date	

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademerk Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

¹ Unique chatton designation number. ² Applicant is to place a check mark here if English language Translation is attached.

Shriet

Inder the Paperwork Reduction Act of 1995, no persons are required t		proved for use through 07/31/2006. OMB 0651-0031 mark Office; U.S. DEPARTMENT OF COMMERCE attor unless it contains a valid OMB control number.
Substitute for form 1449/PTO	Co	mplete if Known
	Application Number	10/052,004
INFORMATION DISCLOSURE	Filing Date	1/17/2002
	First Named Inventor	Anthony C. Zunnan

INFORMATION DISCLOS STATEMENT BY A

(Use as many sheets as

ADDITIONALE	First Named Inventor	Anthony C. Zuppero	_
APPLICANT	Art Unit	1753	_
necessary)	Examiner Name	Alan D. Diamond	
	Attorney Docket Number	22122878-10	_
	,		

	OTHER PRIOR ART — NON PATENT LITERATURE DOCUMENTS Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the				
Examine: Initials	Cite No.1	item (book, megazine, journat, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	12		
·		AGRANOVICH, V. M. et al., "New concept for organic LEDs: non-radiative electronic energy transfer from semiconductor quantum well to organic overlayer", Elsevier Science, Synthetic Metals, 2001, Vol. 116, pages 349-351.			
			T		
			1		
1			T		
			T		
,- -			-		

Examinar	Date	
Signature	B .	_
Oignatule	Considered	

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINET: Initial II reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Unique cibition designation number. 2 Applicant is to place a check mark here if English tanguage Translation is attached.

PTO/SB/08A (08-03)

Under the Paperwor	nk Reduction Act of 1995, no persons are requir		proved for use through 07/31/2005. OME mark Office; U.S. DEPARTMENT OF C after unless it conteins a wolld OMB con-	
Substitute for form		Co	mplete if Known	TO HOME
,		Application Number	10/052,004	
MINDEM	ATION DISCLOSURE	Filing Date	1/17/2002	
		First Named Inventor	Anthony C. Zuppero	
	IENT BY APPLICANT	Art Unit	1753	
, (Use i	es many sheets as necessary)	Examiner Name	Alan D. Diamond	
Sheet	of	Attorney Docket Number	22122878-10	

Examiner	Cite	Document Number	Publication Date	T DOCUMENTS	
Initials*	Cite No.1	Number-Kind Code ² of Innove)	MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-6,537,829	03-2003	Zarling et al.	
		US-6,444,476	09-2002	Morgan, Christopher Grant	
		US-6,399,397	06-2002	Zarling et al.	
				•	
		US-6,312,914	11-2001	Kardos et al.	
 .	_		•		
		US-6,251,687	06-2001	Buechler et al.	51
		US-6,238,931	05-2001	Buechler et al.	
	_				
	. 4		, , , , , , , , , , , , , , , , , , ,		
	-1	US-6,159,686	12-2000	Kardos et al.	
			. !	·	-
		US-5,891,656	04-1999	Zarling et al.	_1'

Examiner Initials*	Cite No.1	Foreign Patent Document	GN PATENT DOCU Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages	Г
		Country Code ³ "Number ⁴ "Kind Code ⁶ (# known)	MM-DD-YYYY	- Photon or Didd Bookingin	Or Relevant Figures Appear	T
			<u> </u>			
					•	
					<u>.</u>	L
						-
						-

Considered Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Considered

Consid

Date

Translation is attached.

This collection of Information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process; an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

if you need assistance in completing the form, call 1-800-PTO-9199 (1-800-788-9199) and select option 2.

PTO/SB/08A (08-03) Approved for use through 07/31/2008. OMB 0651-0031

Inder	the Paperwork Reduction Act of 1995, no persons are required to	respond to a collection of informa	ition unless it contains a valid OMB conti	oj nimbe		
Substitute for form 1449/PTO		Complete if Known				
		Application Number	10/052.004			
INI:ORMATION DISCLOSURE		Filing Date	1/17/2002			
	First Named Inventor	Anthony C. Zuppero				
J	STATEMENT BY APPLICANT	Art Unit	1753			
	(Use as many sheets as necessary)	Examiner Name	Alan D. Diamond			
et	of	Attorney Docket Number	22122878-10			

Document Number umber-Kind Code ^{2 (Flamme)} 003/0207331 003/0166307 003/0100119 003/0030067 003/0019517	11-2003 09-2003 05-2003 02-2003	Name of Patentee or Applicant of Cited Document Wilson et al. Zuppero et al. Weinberg et al. Chen, Wei	Pages, Columna, Lines, Where Relevant Passages or Relevant Figures Appear
003/0207331 003/0166307 003/0100119 003/0030067	09-2003 05-2003	Zuppero et al. Weinberg et al.	
003/0166307 003/0100119 003/0030067	09-2003 05-2003	Zuppero et al. Weinberg et al.	
003/0100119 003/0030067	05-2003	Weinberg et al.	
003/0030067			
	02-2003	Chen, Wei -	
003/0019517		1	
	01-2003	McFarland, Erick W.	
002/0121088	09-2002	Zuppero et al.	
002/0070632	06-2002	Zuppero et al.	
002/0045190	04-2002	Wilson et al	
002/0017827	02-2002	Zuppero et al.	
	. 1		
700,056	03-2004	Zuppero et al.	
649.823	11-2003	Zuppero et al.	
	002/0017827	002/0017827 02-2002 700,056 03-2004	002/0017827 02-2002 Zuppero et al. 700,056 03-2004 Zuppero et al.

FOREIGN PATENT DOCUMENTS						
Examiner Citie Initials* No.1 Foreign Patent Document Country Code3*Number 1*Kind Code8 (# known)	Cite No.1	Cite Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages	Π
	MM-DD-YYYY	The state of the s	Or Relevant Figures Appear	. Τ*		
	<u> </u>					
					4.	L
	<u> </u>					┡
				·		<u>Ļ</u>
					[1

Examiner		
	Date	
Signature	Considered	l
_	Cutisidered	•

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. Applicant's unique citation designation number (optional). See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. Applicant is to place a check mark here if English language

the appropriate symbols as indicated on the document under WIPO Standard ST.16 of possible. Applicant is to place a creat main tiero it engages Translation is attached.

Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Tredemark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form. call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

PTO/SB/08A (08-03)

Approved for use through 07/31/2005 (08-03)

Approved for use through 07/31/2005 (08-03)

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of Information unless it contains a valid OMB control number.

Complete if Known Substitute for form 1449/PTO Application Number 10/052,004 Filing Date 1/17/2002

INIFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

First Named Inventor Anthony C. Zuppero Art Unit 1753 Alan D. Diamond Examiner Name Attorney Docket Number | 22122878-10

Examiner	Cit€	Occument Number	Publication Date	T DOCUMENTS Name of Patentee or	Pages, Columns, Lines, Where
Initiats*	No.	Number-Kind Cods ^{2 (Flancier)}	MM-DD-YYYY	Applicant of Cited Document	Relevant Passages or Relevant Figures Appear
	`	US-5,763,189	06-1998	Buechler et al.	
		US-5,736,410	04-1998	Zarling et al.	
		US-5,698,397	12-1997	Zarling et al.	
<u>-</u>		US-5,674,698	10-1997	Zarling et al.	
	::	US-5,632,870	05-1997	Kucherov, Yan R.	
		us-	T	1	
		US-			
		US-	 		
		US-			
		US-	 		
		US-	 		<u> </u>
		US-			
		US-	 		<u> </u>
		US-	 		<u> </u>
		US-	ļ		
		U\$-			<u> </u>
		US-			

Examiner	Cite	Foreign Patent Document	IGN PATENT DOCU			
Initials*	No.	- oreign ratent bocument	Publication Date	Name of Patentee or	Pages, Columns, Lines,	1
		Country Code ³ "Number ⁴ "Kind Code ⁶ (# known)	MM-DD-YYYY	Applicant of Cited Document	Where Relevant Passages Or Relevant Figures Appear	76
-		WO 01/28677A1	04-2001	Zuppero et al.		
		JP-02157012A	06-1990 -			
					<u> </u>	┝
						-
- 1						

Examiner			
Signature	Date		
41g/illitor G	Considered	•	
OF VALUE OF			

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered, include copy of this form with next communication to applicant. Applicant's unique citation designation number (optional). See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). For the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. Applicant is to place a check mark here if English language

Translation is attached.
This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, cell 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Approved for use through 07/31/2006. OMB 0651-033)

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Index the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid CMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete If Known Application Number 10/052,004 Filing Date 1/17/2002 First Named Inventor Anthony C. Zuppero Art Unit 1753 **Examiner Name** Alan D. Diamond Attorney Docket Number 22122878-10

	<u> </u>		U.S. PA7	ENT DOCUMENTS	
Examiner Initials	Cite No. 1	Dacument Number Number- Kind Code ¹ (if known	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US- 2002/0121088 A1	09-05-2002	- Zuppero et al.	
		US-4,012,301	03-1977	Rich et al.	
		US-5,470,395	11-1995	Yater et al.	
	1	S-2003/0000570 A1	01-2003	Zuppero et al.	
	ļu	S-2003/0166307 A1	09-2003	Zuppero et al.	
]		
1		İ			
	1				

		FQR	EIGN PATENT D	OCUMENTS		-134
Exeminer Initials		Foreign Patent Document County Code 3 - Number 4 - Kind Code 9 (# known)	Publication Date , MM-DO-YYYY	Name of Palentee or Applicant of Cited Document	Pages, Columna, Lines, Where Relevant Passages or Relevant Figures Appear	Ţ.
		WO 01/29938 A1	4-2001	· NeoKismet L.L.C.		÷
<u></u>						=
-						
				\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		:
			·			-

Examiner Signature	Date	
	Considered	· .

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw tine through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional).

2 See Kinds Codes of USPTO Patent Occuments at www.uspto.gov or MPEP 901.04.

3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3).

4 For Japanese patent documents, the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible.

5 Kind of document by the English language Translation is attached.

6 Light New Statement Texture Te

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Commissioner for Patents, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTO/SB/08A (08-03)

Under the Paperwork Reduction Act of 1995, no persons are required to	U.S. Patent and Trade to respond to a collection of Informa-	emark Office; U.S. DEPARTMENT OF COMMERC			
Substitute for form 1449/PTO	Complete if Known				
	Application Number	10/052,004			
INFORMATION DISCLOSURE	Filing Date	1/17/2002			
STATEMENT BY APPLICANT	First Named Inventor	Anthony C. Zuppero			
(Use as many sheets as necessary)	Art Unit	1753			
hant I	Examiner Name	Alan D. Diamond			
neer (of	Attorney Docket Number	22122878-10			

		<u> </u>	U.S. PAT	ENT DOCUMENTS	
Examiner Initials		Document Number Number-Kind Code ³ (# known	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Wher Relevant Passages or Relevan
		US. 6,232,546	05-15-2001	Dimatteo et al.	Figures Appear
		us. 6,396,191	05/28/2002	Hagelstein et al.	
		us. 5,057,162	10/15/1991	Nelson	
		us. 5,593,509	01/14/1997	Zuppero et al.	
]	U8-			
	[US-		er manda e sing sings pag 10 kilologis nam alayana magaa hay chipsamay kayaninada aya.	
		US-		No. 1981 II. Strands in the section day of the contract of the section of the sec	
		US-		mark to the mark training out only the party and the party of the part	mandage of control of malayers, a roder control of the control of
	[US-			
	I	us-			and the same of th
	[US-			
		UŞ-			· Pallint with parling and the state of the property and the state of the property and the state of the state
	[US-		The Park Control Control of State Control States and Park Control of States and Park Control of States and Sta	and the same of the same of the proof of the same of t
	[US-			The state of the same and the s
		US-			
		US-			
	\Box	US-			
		US-			
		US-			
		VS-			

	 FORE	IGN PATENT D	OCUMENTS		
Examiner Initials	 Foreign Patent Document Courty Code 3 - Number 4 - Kind Code 4 (Norm)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Refevant Passages or Refevant Figures Appear	70
				• •	

Evening		
Examiner Signature	Date	
	Considered	

*EXAMIVER: initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered, include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at www.uspto.gev or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 18 if possible. 8 Applicant is to place a check mark here if English language Translation is attached.

Burden Four Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Petent and Tradema k Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTO/SB/98A (08-03)
Approved for use through 07/31/2005. OMB 0651-0031
U.S. Petent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control rule.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Co	mplete if Known
Application Number	10/052,004
Filing Date	1/17/2002
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-10

		OTHER PRIOR ART NON PATENT LITERATURE DOCUMENTS
Examiner inlitets	Cite No. 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue
	<u>.</u>	ACHERMANN, M. et al., "Carrier dynamics around nano-scale Schottky contacts: a femtosecond near-field study", Applied Surface Science 7659 (2002) 1-4.
		AESCHLIMANN, M. et al., "Competing nonradiative channels for hot electron induced surface photochemistry", Chemical Physics, April 15, 1996, pp. 127-141, Vol. 205, Issue: 1-2.
• • • • • • • • • • • • • • • • • • •	L	AESCHLIMANN, M. et al., "Ultrafast electron dynamics in metals", The Ultrafast Surface Science Group, http://www.ilp.physik.uni-essen.de/aeschlimann/2y_photo.htm (Date Unkneun).
		AUERBACH, D. et al., "Reagent Vibrational Excitation: A Key to Understanding Chemical Dynamics at Surfaces?", abstract only. (Dr.te (Inknown).
	8	BALANDIN, A. et al., "Significant decrease of the lattice thermal conductivity due to phonon confinement in a free-standing semiconductor quantum well", Physical Review B, July 15, 1998;
	4	Vol. 58, Issue 3, pp. 1545-1549.
		BALANDIN, A. et al., "Effect of phonon confinement on the thermoelectric figure of merit of : quantum wells", Journal of Applied Physics, December 1, 1998, Vol. 84, Issue 11, pp. 6149-6153
		BONN, M. et al., "Phonon- Versus Electron-Mediated Desorption and Oxidation of CO on Ru(0001)", Science, Vol. 285, Number 5430, Issue of 13 Aug 1999, pp. 1042 - 1045-
	· s	CHANG, Y. et al., "Coherent phonon spectroscopy of GaAs surfaces using time-resolved second-harmonic generation", Chemical Physics, 251/1-3, pages 283-308, (2000)
1	J	CHEN,-C. et al., "Hot electron reduction at n-Si/Au thin film electrodes", fournal-of-the-Electrochemical-Society, Vol. 139, November 1992, pages 3243-3249.
	C	CHOI, C.K. et al., "Ultrafast carrier dynamics in a highly excited GaN epilayer", Physical Review 8, Vol. 63, 115315, 15 March 2001, 6 pages.

Examiner			
		I 0 - 1 - 1	
01.	•	Date	
Signature			
	,	L O = = = 1 - 1	
		Considered	
/AA4141EP			

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the Individual case. Any Office, Washir glon, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTO/SB/08A (08-03)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Complete if Known Substitute for form 1449/PTO **Application Number** 10/052,004 Filing Date 1/17/2002 INFORMATION DISCLOSURE First Named Inventor Anthony C. Zuppero STATEMENT BY APPLICANT Art Unit 1753 (Use as many sheets as necessary) Examiner Name Alan D. Diamond Attorney Docket Number 22122878-10

Examiner	Cite	include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the	
In tlats	No. 1	item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue	
_		DEBERNARDI, A. et al., "Anharmonic Phonon Lifetimes in Semiconductors from Density-Functional Perturbation Theory", Physical Review Letters, VOL. 75, NUMBER 9, 28 AUGUST 1995, pp 1819 - 1822.	
		DELFATTI, N. et al., "Temperature-dependent electron-lattice thermalization in GaAs", Physical Review B, 15 FEBRUARY 1999-I, Vol. 59, Number 7, pp 4576 - 4579.	
		DENZLER, D.N., et al., "Surface femtochemistry: Ultrafast reaction dynamics driven by hot electron mediated reaction pathways", Femtochemistry and Femtobiology: Ultrafast Dynamics in Molecular Science. (World Scientific. 2002).	^
		DIESING, D. et al., "Surface reactions with hot electrons and hot holes in metals", Surface Science, 331-333, 1995, pages 289 - 293.	
] 		DRISKILL-SMITH, A. A. G. et al., "The "nanotriode:" A nanoscale field-emission tube", Applied Physics Letters, November 1, 1999, Vol. 75, Issue 18, pp. 2845-2847.	
1		FAN, C. Y. et al., "The oxidation of CO on RuO2 - 110 - at room temperature", Journal of Chemical Physics, Vol. 114, Number 22, 8 June 2001, P 10058.	1
		FRESE, K.W., Jr. et al., "Hot electron reduction at etched n-Si/Pt thin film electrodes", Journal-of-the-Electrochemical-Society, Vol. 141, September 1994, pages 2402-9.	1
		FUNK, S. et al., "Desorption of CO from Ru - 001 - induced by near-infrared femtosecond laser pulses", Journal of Chemical Physics, Vol. 112, Number 22, 8 June 2000, pages 9888 - 9897.	İ
	·	GADZUK, J. W., "Resonance-assisted hot electron femtochemistry at surfaces", Physical Review Letters, May 27, 1996, Vol. 76, Issue 22, pages 4234-4237.	Ì
Ţ	•.	GADZUK, J. W., "Multiple Electron Processes in Hot-Electron Ferntochemistry at Surfaces" http://www.cstl.nist.gov/div837/837.03/highlite/gadzuk1999.htm (Date Unknown)	
		GADZUK, J. W., "Surface Femtochemistry with Fest Lasers and Slow Nanostructures", http://www.cstl.nist.gov/div837/837.03/highlite/previous/dietmim.htm (Ooke Unknown);	
Examiner Signature		Date Considered	

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Drew fine through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTO/SB/08A (08-03)
Approved for use through 07/31/2006, OMB 0651-0031
U.S. Pelent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Urder the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Complete if Known Substitute for form 1449/PTO **Application Number** 10/052,004 Filing Date **INFORMATION DISCLOSURE** 1/17/2002 First Named Inventor Anthony C. Zuppero STATEMENT BY APPLICANT Art Unit 1753 (Use as many sheets as necessary) Examiner Name Alan D. Diamond Sherit Allorney Docket Number 22122878-10

Exeminer nitials	Cite No. 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), n	
	, 	GAILLARD, F. et al., "Hot electron generation in aqueous solution at oxide-covered tantalum electrodes. Reduction of methylpyridinium and electrogenerated chemiluminescence of Ru(bpy)32+", Journal of Physical Chemistry B. Vol. 103, No. 4, January 28, 1999, pages 667-74.	
	.,	GAO, S., "Quantum kinetic theory of vibrational heating and bond breaking by hot electrons", Physical Review B, Vol. 55, No. 3, 15 January 1997-I, pages 1876-1886.	
		GERGEN, B. et al., "Chemically Induced Electronic Excitations at Metal Surfaces", Science, Vol. 294, Number 5551, Issue of 21 December 2001, pages 2521-2523.	_
•	. /	GUO, J. et al., "The description yield dependence on wavelength of femtosecond laser from CO/Cu(111)", Annual Meeting of the American Physical Society, March 1999, Atlanta, GA;	
.	(Session BC18 - Surfaces (General), ORAL session, March 21; Room 258W, GWCC [BC18.06]	
	<u>, , , , , , , , , , , , , , , , , , , </u>	HESS, S. et al., "Hot Carrier Relaxation by Extreme Electron - LO Phonon Scattering in GaN", http://www.physics.ox.ac.uk/rtaylor/images/hot%20carrier%20poster.pdf (Date Unknown).	
	÷	HOFER, U., "Self-Trapping of Electrons at Surfaces", Science, Vol. 279, Number 5348, Issue of 9 January 1998, pages 190 - 191.	†
	* <u>;</u>	KATZ, G. et al., "A theoretical study of hole induced desorption", Journal of Chemical Physics, October 22, 1999, Vol. 111, Issue 16, pages 7593-7598.	
-}		LEE, B. C. et al., "Transmission of longitudinal optical phonons through a barrier in uniaxial crystals", Physical Review B, Vol. 65, 153315, 15 April 2002.	
<u> </u>		NANOLITE, "NANOLITE Sparkflashlamp", http://www.hsps.com/products/nanolaen.htm (Date Un Known)_	
1		NIENHAUS, H., "Electronic excitations by chemical reactions on metal surfaces", Surface Science Reports, 45, (2002), pages 1 - 78.	
			1

	Name and Address of the Owner, where the Owner, which is the Owner, which is the Owner, where the Owner, which is the Owner, which		
Examiner		Date	
Signature		Considered	
		The state of the s	

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any commens on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

^{*}EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached.

PTO/SB/08A (08-03)
Approved for use through 07/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Complete if Known Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Application Number 10/052,004 Filing Date 1/17/2002 First Named Inventor Anthony C. Zuppero Art Unit 1753 Examiner Name Alan D. Diamond Attorney Dockel Number 22122878-10

E):aminer In tials	Cite No. 1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the Item (book, magazine, journal, sarial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	I
		PLIHAL, M. et al., "Role of intra-adsorbate Coulomb correlations in energy transfer at metal surfaces", Physical Review B, July 15, 1998, Vol. 58, Issue 4, pages 2191-2206.	Ţ
•	 	PONTIUS, N. et al., "Size-dependent hot-electron dynamics in small Pd-clusters", Journal of Chemical Physics, December 8, 2001, Vol. 115, Issue 22, pages 10479-10483.	T
•	 	PRYBYLA, J. A. et al., "Femtosecond time-resolved surface reaction: Desorption of CO from Cu(111) in < 325 fsec", Physical Review Letters, January 27, 1992, Vol. 68, Issue 4, pp. 503-506.	
_		RINNEMO, M., "Catalytic Ignition and Kinetic Phase Transitions", http://www2.lib.chalmers.se/cth/diss/doc/9596/RinnemoMats.html (Dote Unknown)_	Ĭ.
	/ /	SAALFRANK, P. et al., "Quantum dynamics of bond breaking in a dissipative environment: Indirect and direct photodesorption of neutrals from metals", J. Chem. Phys. 105 (6), 8 August	١.
	7	1996, pages 2441 - 2454.	
		SUNG,-YE., et al., "Enhancement of electrochemical hot electron injection into electrolyte solutions at oxide-covered tantalum electrodes by thin platinum films", Journal of Physical Chemistry B., Vol. 102, No. 49. December 3, 1998, pages 9806-11.	-
		WHITE, J. M., "Using photons and electrons to drive surface chemical reactions", Journal of Molecular Catalysis A: Chemical 131, 1998, pages 71-90.	
	<u> </u>	ZHDANOV, V.P. et al., "Substrate-mediated photoinduced chemical reactions on ultrathin metal films", Surface Science, Vol. 432 (#3), pages L599-L603, Jul 20, 1999.	
		ZHU, XY., "Surface photochemistry: from hot reactions to hot materials", Surface Science, ¥61. 390, (1997), pages 224-236.	
Ex aminer	T	Date	

^{*}EXAMINER: Initial if reference considered, whether or not clietion is in conformance with MPEP 609. Oraw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

Burden Hc w Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.